A TREATISE

ON

VETERINARY MEDICINE,

VOL. III.

CONTAINING

PRACTICAL OBSERVATIONS

ON THE

STRUCTURE, ECONOMY, AND DISEASES OF

THE DIGESTIVE ORGANS

OF

THE HORSE,

AND

OTHER DISEASES RESULTING FROM THEM.

ALSO

PRACTICAL OBSERVATIONS

ON THE

TREATMENT AND PREVENTION OF LAMENESS.

BY JAMES WHITE,

Veterinary Surgeon, late of the First or Royal Dragoons.

VENIENTI OCCURRITE MORBO.

THE EIGHTH EDITION.

LONDON:

PRINTED FOR LONGMAN, REES, ORME, BROWN, AND GREEN; BALDWIN AND CRADOCK; J. BOOKER; WHITTAKER, TREACHER, AND CO.; T. TEGG; SIMPKIN AND MARSHALL; HURST, CHANCE, AND CO.; AND W. JOY.

1830.

PLATE I. Nerve Operation. Frontispi[ece]

DEDICATION.

TO

JOHN ABERNETHY, ESQ. F. R. S.

&c. &c. &c.

SIR,

IN dedicating the following pages to you, I feel considerable gratification, especially as I have received your permission to do so. As the book is but small, I flatter myself you will honour it with a perusal, and then I trust you will find that the valuable instructions I have derived from your Works, as well as from your Lectures, in addition to those for which I am

so much indebted to Mr. Coleman, have enabled me to contribute something to the improvement of Veterinary Science.

I am,

SIR,

Your obliged

And most obedient Servant,

JAMES WHITE.

PREFACE.

THE more I reflect on the various subjects connected with veterinary medicine, the more am I convinced that almost all the Diseases of the Horse are the effects of immoderate and too early work, and of injudicious management with respect to feeding. This opinion I have many times given, because it appears to be important, and might, if duly impressed on the minds of horse proprietors, lead to a prevention of the numerous and often incurable disorders, by which this valuable animal is now so frequently rendered unserviceable.

The present Edition is considerably altered, and I trust it will be found improved. The favourable reception it has met with has not

failed, I hope, to make a suitable impression on my mind, and will encourage me to continue my attention to Veterinary Science as long as I am able to contribute to its improvement.

All kinds of Veterinary Instruments may be had at Mr. Long's, Veterinary Instrument Maker to the Veterinary College, &c. 217, High Holborn, London; and of Mr. Clarke, Cutler, &c. York Buildings, Bath.

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A

TREATISE

ON

VETERINARY MEDICINE.

CHAPTER I.

ON THE DIGESTIVE ORGANS.

In describing the digestive organs, it is necessary to begin with those parts by which food is prepared for the stomach, and to point out the state in which that food should be, previously to its being taken into the mouth. In doing this, let us consider the animal in a state of nature, and we shall find that the food which nature has prepared for him is full of juices, and such as is most fit for digestion, nutrition, and the various purposes of the animal economy. The horse is a graminivorous animal; therefore, when brought into the stable, kept on dry grain, hay, straw, or other dry provender, numerous diseases may be expected, unless guarded against by prudent management. The consequences of neglecting this precaution are

diseases of the *digestive organs*, as they are named, that is, the stomach and other parts subservient to digestion. The precautions to be taken are not many, nor are they difficult to be understood or practised; yet are they so generally neglected, that such diseases are more frequent than any, and lead to others which at present are suspected but by few to be connected with them. The reader will perhaps think it strange when I assert that the farcy, glanders, staggers, and many other diseases, may be traced to this source. These diseases have formed the principal subject of the first volume of my Treatise on Veterinary Medicine. Within a short period I have been led to reflect on these diseases in particular, and these reflections have induced me to take such views of the subject as will, I hope, enable me to convey to the public more useful information than any I have yet given. To do this in a manner sufficiently clear to be generally understood, it is necessary to begin with mastication and the state of the food.

State of the Food.

Hay, as it is often given, is too dry for mastication, and often for digestion. For hay that

has been suffered to stand until the seed becomes ripe, is very deficient in nutriment, and difficult of digestion; and however perfectly it may be masticated, will only serve to oppress the stomach without affording any thing that is capable of being formed into good chyle. Hay that has been kept more than one year becomes dry and deficient in nutriment, especially when kept in small mows and exposed to the wind. When such hay therefore is given to horses, it requires to be moistened with water, and given in moderate quantity. From eight to twelve pounds of hay and one peck of oats is a sufficient allowance, both as to proportion and quantity, for any saddle horse of whatever size he may be, provided he has only moderate work; but when his exertions exceed that degree which may be termed moderate, then an additional allowance is necessary, and that addition should be in oats or beans.

To return to mastication. The teeth may be imperfect, and often are so; the grinders wear in a different manner from that in which they would, were the animals in a state of nature; consequently sharp edges are sometimes formed on the outside of the higher grinders, and on the inside of the lower grinders; and the inside of the cheeks and the tongue, with the skin or membrane connected with it, are thereby wounded,

which prevents the horse from masticating, without considerable pain, and induces him to swallow his food imperfectly chewed: this is more especially the case with hay; and when hay is swallowed in this state, it does harm, being difficult of digestion, as then its nutritive matter is not easily extracted by the gastric power; hence arise indigestion, flatulency, and numerous disorders. Mastication may be impeded or prevented by that state of the mouth which generally attends teething: it may also be affected by an injudicious use of the bit (as is well known in regiments of cavalry where it is too common), and has been attributed to the spiculæ of the squirrel-tail grass. The consequence of this imperfection is worms, in addition to indigestion and all its consequences.*

* I have lately seen at the kennel, the jaws of two horses, one of which died literally from starvation, in consequence of a disease of the grinding teeth, which appeared to have been brought on by feeding on coarse woody hay, containing the stalks of thistles, docks, &c. This animal was what dealers term a *quidder*, for the muscles of deglutition were at last so affected, that he was incapable of swallowing; and after fruitless attempts to chew his food, it was thrown out into the manger in a ball or quid, and a great deal of imperfectly chewed hay had been forced into the cavities, formed at the roots of some of the grinding teeth. The other horse had sharp or rather keen edges on the outside of the upper grinders, and the inside of the lower grinders,

Deglutition.

Swallowing may be impeded by an inflammation of the throat: this prevents the food from being conveyed into the stomach, either partially or wholly, unless a suitable diet is prepared for the animal.

It may too be impeded by a palsy of those muscles by which it is effected. This palsy may be total or partial; in the first case the animal is starved; in the latter he lingers longer, but is ultimately destroyed by it; for the remedies usually employed are those which perhaps produced the disorder, that is, drawing out the tongue by giving balls, and pulling it with such force as frequently to lacerate its under part,

by which the inside of the cheeks and the tongue had been much injured. In this horse there did not appear to have been any impediment to swallowing, for both the stomach and bowels were full of imperfectly masticated hay and unbroken oats. The stomach had burst and discharged some of its contents into the abdomen; the large bowels contained an enormous quantity of undigested and imperfectly masticated hay and corn; the liver was enlarged, and of a colour approaching to that of lead. The horse had died of the fret or flatulent colic, and had worked only the day before his death in a coal waggon. There was a great number of botts in the stomachs of both horses, and a considerable number in the duodenum, or first intestine of the former horse.

and otherwise injure the muscles of deglutition. Swallowing may be thus prevented, and often is. The practice of tying a horse's tongue to prevent him from running away may not be frequent, but I have known it done, and the loss of the tongue was the consequence. Three cases of this kind I have met with; one I was told of by the person who did it, and who cut off the swollen part of the tongue to relieve the animal from his intolerable sufferings, the ligature being buried in the enormous swelling that had taken place. Two others I have heard of, in which the tongue was literally drawn out by the roots. The most common manner in which the tongue is wounded is, by the horse hanging back when he is tied up with a coil of the halter in his mouth and over the tongue; or, as it is vulgarly termed, with a *chew* or *chaw* in his mouth. The organs of swallowing may be injured by the practice of giving balls, especially when they are large or hard. A morbid state of the pharynx is thereby induced, which renders deglutition difficult, and sometimes impossible, the lower part of the pharynx acquiring a morbid irritability, which causes it to contract upon the approach of the food and return it into the nostrils, or into the mouth, where it is often re-masticated, and at length thrown out into the manger like a quid of tobacco. Such horses have been named

quidders by dealers, and are considered of little or no value: such cases I have seen; they are often incurable, and sometimes so because not understood. Were the horse kept a few weeks on gruel and bran-mashes, and then turned to grass, the muscles of deglutition may gradually recover their lost power. I have lately met with a case, in a mare, where both swallowing and breathing were impeded by ulceration of the pharynx, or upper part of the œsophagus or gullet, produced probably by her having swallowed hastily some hard or sharp substance, such as a stub of wood, or the unchewed stalk of a dock, thistle, fern, or bramble. The pain and irritation which swallowing occasioned caused coughing, and some of the food to be thrown into the nostrils, and some into the larynx, where it produced a great deal of pain and difficulty in breathing, so much so that they were about to destroy the animal. But I afforded great relief by making an opening in the windpipe, and passing a surgeon's probang into the opening, and up through the larynx, and then quickly withdrawing it. I then passed it up again, and withdrew it a second time, in order to remove completely, or as far as could be, whatever might be lodged in the larynx. I put two stitches in the skin over the opening in the windpipe, and did nothing more. The mare was greatly relieved,

and brought up a colt she had. When the colt was fit for weaning, the mare being of little value was destroyed, and then the ulceration in the pharynx was discovered. I saw the animal just before she was killed, and found her breathing freely and looking tolerably well (considering she had been kept at grass, and on a common), and with a good udder of milk. But the owner informed me that she appeared sometimes much distressed, and coughed a great deal, probably by some food still getting into the larynx.

Obstructions in the Œsophagus.

Food is sometimes prevented from passing into the stomach by balls sticking in the œsophagus or gullet: such accidents are more common than they are supposed to be; for the ball is often in that part of the œsophagus which lies within the chest. Cases of this kind are incurable, and ought never to occur; for balls when properly made and skilfully given will pass into the stomach with certainty and ease. Balls may also stick in the pharynx, and then they may be drawn out with the hand. Such cases occur more frequently than the former, and from not being understood, the ball generally remains until gradually dissolved, or till it is thrown into the

nostrils, where it causes considerable inflammation, and such a discharge of matter as has been mistaken for the glanders. When a ball sticks in the throat and cannot be taken out by the hand, it should be forced down into the stomach by means of a long piece of cane with a smooth ball of wood firmly secured at one end of it.

State of the Stomach.

The stomach of the horse in his domesticated state is seldom perfectly healthy, and the departure from this healthy state is generally occasioned by the mode of feeding, grooming, and exercising, that is generally adopted. By exercising, the reader is not to understand the work which the animal does; but that want of sufficient exercise by which many diseases are produced. This state of the stomach is one that is easily cured; for the cause being removed, the disorder gradually ceases. Another state of the stomach is of a worse and often incurable nature, for it is so gradually induced that its progress is not observed. This is the state which most commonly prevails, and consists in an exhausted state of its nervous power. This exhaustion may be total or partial: In the former case, it is incurable and quickly fatal;

the latter exists in a variety of degrees, and produces in consequence a diversity of symptoms or diseases. These diseases are of more importance than any to which the animal is liable, and are less generally understood. Imperfect digestion, weakness of appetite, inordinate or craving, vitiated or foul, appetite, staggers, flatulent colic, inflammation of the bowels and of the lungs, worms, and chronic cough, are among the number.

Exhaustion of the stomach's sensorial or nervous power in the various degrees in which it occurs, may arise from over-feeding even upon good food, but more frequently from that which is bad or difficult of digestion. Exhaustion of the sensorial power of the stomach may arise from excessive labour, and this sometimes happens to post and coach horses. Such is the nature of their employment, and so excessive is their exertion, that the stomach cannot digest what is sufficient to supply the waste of the body. Their work is irregular; they have sometimes a day's rest, but the effect which might otherwise result from this is generally prevented by the loaded stomach and bowels they are taken out with, when they return to their labour: hence arise flatulent cholic, inflammation of the bowels, and sometimes sudden death. Numerous cases of this kind I have

met with. Exhaustion of the sensorial power of the stomach may arise also from feeding upon indigestible food, and cases of this kind are very common, occurring at grass as well as in the stable. The disorder that has been named Stomach Staggers is thus produced. Exhaustion of the sensorial power of the stomach may depend also upon abstinence, and this also is frequently occurring. It may be occasioned also by the horse drinking cold pump water, especially if given when the body is heated and fatigued by exercise, or by his standing still in the cold when in that state. Thus excessive exertion, want of salutary exercise, over-feeding on wholesome food, loading the stomach with water, and food that is unwholesome or difficult of digestion,—imperfect mastication, imperfect deglutition, and the dryness of the provender, may produce all that variety of diseases which I have briefly alluded to.

CHAPTER II.

ON THE STOMACH AND BOWELS.

In the healthy state of the stomach, the animal's appetite is such as leads him to eat that only which is fit for the formation of pure blood. This food is grass, for he is certainly by nature a graminivorous animal. The horse's stomach is remarkably small, and requires to be frequently supplied with food; therefore, in a state of nature, we find him almost constantly feeding. How great then must be the change which the animal suffers when brought into the stable, and what serious evils ought we not to expect, unless this change is gradually brought about, and his diet and exercise carefully attended to! When we consider for a moment in what manner he is generally treated, there cannot be any difficulty in believing, that the stomach must of necessity be brought into a morbid condition. The labour he is employed in is frequently excessive; the food he is supplied with is often deficient in nutriment, especially in that kind of nutriment which is natural to his stomach; for even grain is not suitable, because not natural food; and we find that horses which have always been kept

in a state of nature will refuse grain, and require some time and the stimulus of hunger before they can be brought to it. Good hay will always be preferred by such horses, especially when it has that fragrant smell, greenish colour, and herbage, which it ought always to have. But considering the use to which the horse is applied, grain becomes a necessary diet for him; and, if properly dispensed, is the best food that can be given. Hay, when really good (such as will be described), and given in moderation, is a very suitable diet for the horse, but requires to be assisted with grain, in a quantity proportionate to his work. Some grain should always be given, as, without it, the quantity of hay necessary for his support would so distend the stomach, as to induce gradually, by a continuance of such feeding, a morbid or depraved appetite. As it is, the hay often given to horses, even that which is commonly considered good, is so deficient in nutriment, difficult of digestion, and eaten in such immoderate quantities, that the laborious exertions required in the muscular structure of the stomach to extract what nutritive matter it does contain, is such as must of necessity bring on a morbid or depraved appetite; and, what is, if possible, of still greater consequence, an exhausted state of its sensorial power. A small quantity

of wheat straw, when the reed has been carefully separated from it, or oat straw, is better fodder for horses than indifferent or bad hay; but the daily quantity should never exceed four or five pounds. Grain must of course be more freely given in this case; and considering the price of straw, this can well be afforded; but such a diet is far better than that commonly given to horses in this country. In France, wheat straw is very commonly employed as food for horses, and the regularity with which they distribute the diet of horses well deserves the imitation of the horse-owners of this country. The daily allowance is given at three times a day, viz. a moderate quantity early in the morning, a smaller quantity at noon, and the largest portion at night. So general is the practice in this country of giving horses an immoderate quantity of hay, of giving bad hay, of injudiciously distributing the daily allowance both of water and oats, of giving beans unbroken, and of working horses while their stomachs are distended with food, by which much mischief is done, and many fatal diseases brought on,—that we seldom meet with horses whose stomachs are in a perfectly healthy condition. But so numerous are the degrees of morbid condition of the stomach, between the healthy state and that extreme degree of derangement, when the

appetite becomes depraved, inordinate, and even voracious, that it is difficult, if not impossible, to bring each of them under a distinct head. It will be sufficient, for the purpose I have in view, to notice them briefly, and as they relate to the organs of respiration; that is, to treat also of those diseases of the lungs and its appendages, which arise from a morbid condition of the digestive organs. These diseases are commonly known by the names Chronic Cough, Roaring, and those asthmatic affections which when confirmed are named Broken Wind. To accomplish this in a manner sufficiently clear and intelligible, it is necessary to give a concise description of the organs of respiration, and those of digestion.

CHAPTER III.

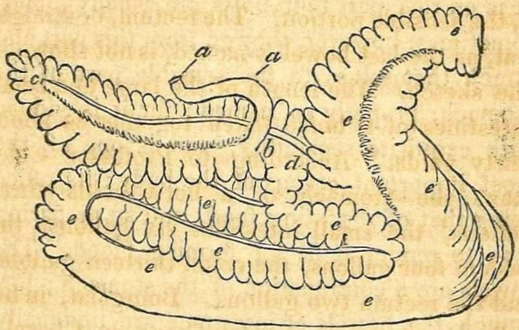
DESCRIPTION OF THE DIGESTIVE ORGANS.

The mouth, the tongue, and the passage to the stomach, are covered with cuticle, but of various degrees of thickness, so that the sensibility of the different parts is nicely adapted to the purposes for which they are designed. These purposes are, gathering the food, masticating it, moistening it with saliva, and swallowing it. The first is effected by the front teeth, the second by the grinders. The saliva is separated from the blood by three pair of glands, named parotid, sublingual, and submaxillary. The parotid glands pour out their saliva through an opening between the second and third grinder on each side, the submaxillary by two small tubular papillæ under the tongue, and the sublingual through numerous ducts on the apex of the tongue: it is by the motions of this organ that the saliva is diffused over the parts where it is required. The saliva is necessary, not only to facilitate mastication and swallowing, but serves likewise a very important purpose in the stomach, being necessary to digestion. The masticated food is carried

by the motion of the tongue into the upper part of the gullet or œsophagus, which is named pharynx. The pharynx is large, and capable of considerable dilatation, but soon contracts into a small yet strong muscular tube, named the œsophagus. The part where the œsophagus begins is so contracted, as to have the appearance of a stricture; and it is here that the strong cuticular, or, as it is commonly named, insensible coat of the stomach begins. When the food gets into the pharynx, it is conveyed into the œsophagus, and from thence into the stomach, by the muscular contraction of those parts. The horse's stomach has nearly one half of its surface lined with that strong cuticular membrane which lines the œsophagus, and terminates abruptly, and by a fringe-like edge. It is on this part that botts are usually found; sometimes, however, they go from this part and attach themselves to the sensible part of the stomach, properly so named; for it is endued with exquisite sensibility, and is one of the most important organs of the body; its office being that of digesting food, and so preparing it as to render it fit for forming blood. The bowels are a continuation of the stomach; for, though the bowels or intestines are nominally divided by anatomists into six parts, they are in reality one canal, which proceeds from the

stomach to the fundament. They are very susceptible of inflammation, and are often brought into that state by the injudicious use of purgative medicines. See vol. ii. art. CATHARTICS. The small intestines do not terminate in the large ones gradually, as may be supposed, but suddenly, as the œsophagus does in the stomach; and in such a manner, that when the mass of food, or even water, has passed into the large bowels, it cannot return. I have endeavoured to illustrate this by the annexed sketch, which serves also to convey some idea of the immense size of the cæcum and colon, compared with that of the small bowels, all of which are about the same size as the ilium, a portion of which is shown in the sketch; *a, a,* part of the

Fig. 1.



small intestine named ilium; *b,* its termination in the cæcum, or blind gut; *d,* the beginning

of the colon; *e, e, e, e, e, e, e, e, e,* the colon. If the reader is desirous of acquiring a correct idea of the form and relative situation of these parts, he may accomplish the object by seeing a horse opened at the kennel, or slaughter-house, and taking this sketch with him. The Plates of the Foot in vol. i. are intended to afford a similar kind of assistance to those who are desirous of acquiring a correct knowledge of the structure of the horse's foot; as the parts can always be procured at the kennel.

Fig. 2.

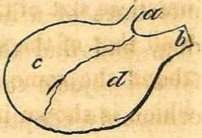


Figure 2 is an imperfect sketch of the stomach or maw; *a,* the œsophagus; *b,* the pylorus, or rather a section of the stomach, to show the internal surface; *c,* the insensible portion of the stomach; *d,* the sensible portion. The rectum, or straight gut, as the last bowel is named, is not shown in the sketch. The length of the large and small intestines of a horse taken together is about thirty yards. According to Professor Coleman, the stomach of a horse holds three gallons, the small intestines six gallons, the cæcum four gallons, the colon thirteen gallons, and the rectum two gallons. Bourgelat, in his "Precis Anatomique du Corps du Cheval," says, the horse's intestines, including the stomach and œsophagus, measure thirty-five

yards, of which the large bowels form from six to nine yards. Professor Girard, in his "Anatomie des Animaux Domestiques," states, that the length of a horse's intestines is equal to eighteen or nineteen times his height, taken in the usual manner, that is, from the ground to the highest point of the withers. In cattle and sheep the length of the intestines is equal to thirty-two or thirty-three times the animal's height: in pigs to twenty-seven or twenty-eight times the animal's height: and in dogs to eight or nine times his height. I have measured the intestines of a horse, a cow, a sheep, and a dog, and find that this rule is correct. M. Girard objects to the division of the intestines commonly adopted by anatomists; and offers one which he considers more simple. The whole of the alimentary and excrementary canal, extending from the throat to the fundament, has been divided by anatomists into several parts; which division is only nominal, for it is in reality only one canal, in which there are two remarkable points: 1st, The termination of the œsophagus, or gullet, in the stomach: and 2dly, of the small intestine named ilium in the cæcum, or blind gut; which in the horse is considered as a second stomach. (See the sketch annexed to this subject.) Professor Girard divides the small intestines into a gastric por-

tion, a middle or floating portion, and a cæcal portion; which he considers more simple and more useful than the division commonly used, viz. into duodenum, jejunum, and ilium. The large intestines he divides in the usual manner into cæcum, colon, and rectum. The middle or floating portion of the small intestines is that which is so easily moved and taken out, and between the folds of which the mesentery is so wide, and exhibits the lacteal vessels so beautifully, when an animal is killed, opened, and examined, about six hours after he has been fed with oats. In other parts of the bowels the mesentery is much shorter, especially between the large bowels; and throughout its whole course is studded with innumerable glands or kernels, named mesenteric glands. It appears that the nutritive juices, or chyle, must pass through these glands before they arrive at that vessel which is named the thoracic duct, and which is considered a common receptacle for all the fluids absorbed from the stomach and bowels. The mesentery has obtained different names according to its situation; between the coils of the colon it is named mesocolon, and that part which is attached to the rectum is named mesorectum.

CHAPTER IV.

ON THE LIVER, PANCREAS, SPLEEN, OR MILT, AND KIDNEYS.

THOUGH the stomach and bowels are by far the most important of the digestive organs, those I am now going to describe are likewise subservient to digestion, or the preparation of the nutritive juices or parts of the horse's food, and their passage through the bowels. The liver is so well known that a particular description of it is unnecessary: its office is to separate bile or gall from the blood, which is not deposited in a gall bladder, as in most other animals, but is conveyed immediately into the first of the small bowels, named duodenum, a few inches from the stomach. The bile is supposed to assist in separating the nutritious matter named *chyle* from the digested mass of food which is named *chyme*, after it has passed out of the stomach. It seems probable, however, that, by its stimulating and gently purgative quality, it promotes that motion of the bowels which causes their contents to pass through them; this is called the *peristaltic* motion of the bowels, and is such that their contents are gradually

propelled towards the fundament. When we consider the peculiar structure of the horse's digestive organs, first in the smallness of the stomach and the great size of the large intestines, it seems probable that nutrimental matter is absorbed throughout the whole of the canal, except the rectum, and perhaps the last portion of the colon. The pancreas or sweet-bread secretes a juice similar to saliva, which is conveyed by the pancreatic duct into the duodenum. The spleen or milt is a large spongy substance, that is attached to the stomach; it receives a great deal of blood by the splenic artery, which, after undergoing some change, is transmitted to the liver.

As all the blood that is sent to the stomach, the bowels, the pancreas, and the spleen, is, after accomplishing the purpose for which it is sent to those parts, returned to the liver to furnish materials for the bile, it must be obvious that any obstruction in the liver, any thickening or plugging up of its vessels, or any inflammation of its substance, must derange the functions of those parts from which it receives blood, in a degree proportionate to the extent of the obstruction and to the importance of the part in the digestive system. It seems probable that the quantity of blood distributed to the stomach, the bowels, and other parts of the

digestive system, is proportionate to the exertion required: and as the power of those parts is exercised in the digestion of food, the absorption of the nutritive part, and the expulsion of the remainder, the quantity of blood sent to the stomach and bowels seems to depend on the quantity and the quality of the food that is taken in. This is an important circumstance, and should always be kept in view. (See *Yellows*.)

The quantity of blood returned to the liver by the veins will be in proportion to the quantity distributed by the arteries to the stomach, bowels, spleen, and pancreas. The liver, however, has a nutrient artery of its own; viz. the hepatic artery, derived from the same trunk, the cæliac, as the arteries which supply the stomach and the spleen. The human liver sometimes becomes hardened or scirrhous in consequence of habitual dram-drinking: in this case there seems to be a gradual condensation and obliteration of its vessels; for dram-drinking in time destroys the appetite; the stomach becomes torpid; and, as scarcely any food is taken in, the stomach and bowels have but little to do, except probably absorbing some of the poisonous fluids which are drank, and conveying them to the liver, and perhaps into the general circulation; where the spirit appears to

be decomposed and carried off by the different emunctories in the form of carburetted and sulphuretted hydrogen gas.

I have never seen the horse's liver in this state but once; more commonly we find it exceedingly tender, so much so that it sometimes bursts, and the horse soon dies from internal hæmorrhage. The horse's liver suffers most commonly by improper feeding, especially by loading the stomach and bowels with hay, by chills, and by immoderate work.

CHAPTER V.

ON DIGESTION.

Having given a short description of the digestive organs, I come now to make some remarks on that important process in which they are employed; viz. the digestion of food; the separation and absorption of the nutritive parts of the digested mass, in its passage through the bowels; and the expulsion of the remainder, with the excrementitious fluids which are thrown off from the blood on the internal surface of the bowels.

I have already observed that all the nutritive juices of the food, whether consisting of a milk-like fluid, named chyle, or other fluids, are conveyed to one common receptacle named the thoracic duct; a vessel that runs along the back and terminates anteriorly in the left jugular vein, or rather in the trunk of the two jugulars (for the horse having no clavicle has of course no subclavian vein), and posteriorly in the lumbar veins. This last termination of the horse s thoracic duct was first noticed, I believe, by Br. Bracey Clarke. All the absorbent vessels of the bowels, as well as the numerous branches

of the arteries and veins connected with the bowels, pass over the mesentery; a membrane by which the convolutions or coils of the bowels are held together. Though digestion is performed chiefly in the stomach, and the most nutritive part of the food appears to be absorbed from the small intestines, yet I think it probable that the digestion of food and the absorption of nutriment is going on through the whole canal, both stomach and intestines, except perhaps in the rectum and some part of the colon. The cæcum, or blind gut, evidently serves as a second stomach; and there can be no doubt, I think, that a great deal of fluid is absorbed from the immense colon, which, in horses that drink largely, appears to be the principal receptacle for water. The cæcum of the horse appears to bear some analogy with regard to its office to the third stomach of the cow, and must be particularly useful when a horse is fed on bad coarse provender, which contains but little nutriment; such food must require a great deal of maceration to give out its nutritive matter, and we may observe that horses so fed are always eager for water. In speaking of the liver, I have shown in what manner it is concerned with digestion; first, it receives the venous blood from the stomach and bowels; secondly, it depurates that blood by

separating bile from it, which is conveyed by the biliary duct into the higher part of the small bowels, for the purpose of separating the chyle from the digested mass of food, and of promoting by its stimulating quality the peristaltic motion of the whole intestinal canal.

I come now to point out some other circumstances by which the state of the stomach and bowels, and consequently digestion, is materially influenced. The sympathy or consent that exists between the stomach and the skin is a stiking circumstance, and one that requires particular consideration. This sympathy is reciprocal, as may be seen by the effects of cold and wet upon the bowels and stomach, and of drinking cold water under certain circumstances upon the skin. It has been remarked that cavalry horses, stationed near the sea, have rough staring coats, are hide-bound, and often otherwise diseased: this probably depends upon the bad quality of the water in such situations. M. Collaine, Professor of the Veterinary School at Milan, says, " I have remarked that in Italy many corps of cavalry, after being stationed a few months near the sea, have been strongly affected with the farcy. I have seen a large dose of infusion of tobacco cause violent shivering; and in some experiments I once made on a glandered horse, the same effect was

uniformly produced by a large dose of a solution of arsenic. Many other circumstances might be adduced to shew the connexion or sympathy that exists between the digestive organs and the skin, or in other words, the organ of perspiration. Many of the diseases of cattle may be traced to this source, and the common term *chill* is by no means an unfit one for many of the diseases of cattle, especially when considered in connexion with the digestive organs; for on these the mischief generally falls Sometimes, however, the organs of respiration or breathing suffer, or in other words, the lungs; and so it is in horses, as will be shown in a future chapter.

From the above circumstances it will be seen how necessary a healthy state of the skin is to the digestive process; and we cannot expect a smooth glossy coat on a horse unless he is kept on wholesome food and water.* This sympathy or consent between the stomach and skin must depend upon their communicating with each other through the medium or intervention of the nerves. It is obvious that the sensorium or brain must be a means of communication between all the nerves or organs of the body; this is shown by making a wound in the skin, or by whipping the animal. This painful im-

* See vol. ii., article *Water*, 5th edit.; and vol. i. article *Urinary Organs*, 15th edit.

pression on the skin, which is the organ of feeling, is communicated with inconceivable rapidity to the sensorium or mind of the animal; and a considerable degree of muscular motion takes place in consequence. But, besides this common medium of nervous communication between the skin and the digestive organs, there is another, through which slight impressions are communicated from one to the other, that is, through the great sympathetic nerve. There is a circumstance to be kept in view with regard to the connexion between the digestive organs and the skin, which is of a strictly practical nature, and will be found of great use. If the horse's skin has been brought to a higher degree of sensibility than is consistent with the purposes he is wanted for, by hot stables, warm clothing, and regular grooming, it may well be expected that exposure to cold and wet, especially if he has been heated and fatigued by exercise, will make such a painful or chilling impression upon the skin as will be communicated to the stomach; in consequence of which there will be a depression of appetite, if there is no food in the stomach; and if that organ has food in it, there will be an interruption to, or a suspension of, the digestive process. The bowels may be affected by the same cause, and when the chilling impression is strong, even the heart may be de-

pressed. When this happens the blood accumulates in the lungs, the heart and the brain, and internal inflammation or fever may be the consequence. Another evil arising from chills is a suppression of the perspirable discharge, either wholly or in part. The excrementitious parts of the blood which would have passed off through this outlet are then thrown back upon the circulation, and cause some degree of disturbance in the body, or fever, until thrown off by the other emunctories. In horses and cattle the kidneys are considerable emunctories, and are easily excited to action; these readily carry off the excrementitious matter as well as the superfluous serum of the blood: but in chills it often falls upon the mucous membranes which line the respiratory or air passages, causing cough, sore throat, and running from the nostrils, often attended with fever. The importance of the nervous system has not been sufficiently attended to in the treatment of horses and cattle.

It is only necessary at present to show how materially digestion is influenced by it, not only in regard to the state of the skin, or to impressions made upon its nerves, whether painful or otherwise, but likewise as it regards the animal's mind and temper. To obtain a perfect digestion, it is not sufficient to supply the horse

liberally wiih good food and water; it is necessary also that he should be made comfortable by being kept in a suitable stable, and being properly groomed, and in every respect treated with kindness. He should never be worked beyond his strength or condition. A horse's capacity for exertion or work depends not only upon his general strength, but upon his habits, and upon the state of his health at the time he is employed. Thus a powerful horse, from living well, and in a state of idleness, may, though looking fat and sleek, be unfit for a moderate journey; or if by living in this manner his stomach has been enlarged and weakened, his bowels loaded with excrement, and consequently stretched and weakened, his liver, and all the venous system, surcharged with blood, a moderate journey may, under such circumstances, bring on a fatal disorder. It requires but little reflection to perceive that whatever contributes to easy digestion in ourselves will do the same in horses; and every one knows that calmness and cheerfulness of mind or temper are conducive, if not absolutely necessary, to a perfect digestion. Thus it is that horses which have been accustomed to company and kind treatment pine and fall off in condition under different management. Old horses that have been accustomed to warm stables often fall off in ap-

petite and condition when placed in such as are cold. A damp stable, or letting a current of air come upon a horse's head, especially if he is brought in sweating from exercise, will so far chill the skin, and interrupt its functions, as to cause that excrementitious matter which should have been discharged by the skin to fall upon the mucous membranes. Those of the lungs, or air passages, are generally affected, or rather most visibly affected; as is denoted by cough, dulness or watering of the eyes, and discharge from the nostrils: but the mucous membrane of the stomach and bowels seldom escapes uninjured, as is seen by the diminished appetite, imperfect digestion, and the looseness or alteration in the state of the dung, which follow.

As the strength and energy of a horse depends upon the muscular and nervous system, it may be useful to inquire in what manner these systems are sustained or nourished, for, like all other parts of the body, they are constantly wearing away by exercise, and would soon go to decay, were they not as regularly repaired. The materials for this purpose are furnished by the blood; it is a matter of the highest importance, therefore, that the blood should be preserved in a state of purity. The most obvious, but not the only means of accomplishing this, is to supply the animal with wholesome food,

and in such quantity as will furnish sufficient blood, and no more;* for, if there be too much blood, the brain, the stomach, the heart, and other internal organs, will be oppressed, and their respective functions more or less impeded. But on this, as on many other occasions, we may observe an inherent and wonderful power of restoration exerted in the body, or, as it is familiarly termed, an effort of nature takes place, by which the superfluous blood is carried off by the kidneys, by the bowels, or by the mucous membrane of the lungs and air passages, or by the skin. One or more of these emunctories, or outlets, may be employed for

* From the harmony observable in the animal economy, when in a state of health, it seems probable that the horse's appetite, in a state of nature, would lead him to take only such a quantity of food as the stomach could perfectly digest; that the act of digestion would be merely healthy exercise for the organ; and that the blood formed from it would be exactly suited, both in regard to quantity and quality, to the various purposes of the body. In his domesticated state, however, the horse's appetite is often a fallacious guide, and however wholesome the food, restraint is generally useful. The consequences of over-feeding with good food are, first, repletion of the blood-vessels; next, weakness of the stomach and bowels, and then internal inflammation or fever, and finally death. Examples of this kind are often occurring to cattle in rich meadow grass, especially the aftermath, and to horses in gentlemen's stables, when they are fed high, and ha e but little exercise.

the discharge of the superfluous blood, or rather of the useless parts of it, until its volume is sufficiently diminished.

It is worthy of observation, however, that in cases of plethora, or repletion of the blood-vessels, in consequence of over-feeding, the mucous membrane of the stomach also is often so affected that the animal's appetite is diminished or lost, according to the emergency, so that the supply of the materials for forming blood is cut off. But supposing the horse's food and water to be of the best kind, and given in proper quantity, still the blood may become imperfect, 1st, by checked perspiration, or improper exposure to cold, as I have before shown, but in a more dangerous manner by working the animal immoderately, and continuing to do so, and in such a degree, that however liberally he may be fed, the stomach will be unable to digest, or to furnish sufficient materials for the repair of the muscular and nervous systems. This alone will in time impoverish the blood, and cause a gradual decay of the whole body. But it too often happens that when a horse is worked immoderately he is not so well attended to in regard to feeding and grooming as he should be, and thus the evil is encreased. The stomach should be considered as a muscular bag, which performs its office partly by contracting upon

the food it receives, compressing it, moving it, and mixing it together, until it is sufficiently prepared to be expelled into the small intestines. Whether there be any of that curious solvent called gastric juice formed in the horse's stomach, a there is in the stomachs of carnivorous animals, is, I believe, uncertain; but besides the gastric juice,* and the muscular or contractile power, there is undoubtedly a peculiar nervous or sensorial power, with which it appears to be endued in an especial manner. The stomach is an organ of such peculiar importance in the animal economy, that it requires to be attended to more particularly than any other part; it prepares the pabulum, or nourishment, for the

* It has been said by eminent physiologists that the energy of the gastric juice is in an inverse ratio to the strength of the muscular coats of the stomach. Now the horse's stomach, when healthy, is probably stronger, with respect to its muscular coat, than that of any other animal; therefore his digestion may depend more upon the muscular power of the stomach than upon the gastric juice. On opening healthy horses that have been killed in consequence of having met with some incurable accident, such as a fracture of the thigh, or the fore-arm, we find not only the stomach with this strong muscular structure, but likewise the small intestines, which are sometimes so thickened in certain parts as to feel almost as a solid body; which proves, I think, that the whole of the small intestines are concerned in the digestion of food as well as the stomach, and in both the absorption of nutriment may be going on.

whole body, and when injured, every part of the system seems to participate in the injury: a violent blow in the stomach, for example, will cause immediate death. If we consider the stomach as a muscular bag, like the urinary bladder, it must be evident that by stretching it so far beyond its natural size, as often happens when a horse is permitted to eat as much hay and drink as much water as he likes, its muscular structure must be proportionably weakened; and it is equally clear that the difficulty experienced in digesting such a mass of food, which is seldom of good quality in such cases, must injure the sensorial or nervous power of the stomach also. When horses are so fed, their bowels are constantly loaded with excrement, and proportionably weakened. The brain is oppressed, and respiration impeded, and the whole muscular system has its energy or strength considerably diminished. I measured the stomach of a colt one year old, and found it capable of holding twelve pints or pounds of water. Probably at four years it would have held two gallons, or sixteen pounds. I once weighed the stomach of a horse that died of stomach staggers; it was quite full, and much distended with nearly dry food; and with its contents, weighed more than sixty

pounds, I believe sixty-four, which is exactly eight gallons.

Since I have directed my attention, in a particular manner, to the subject on which I am now writing, I have examined a great number of stomachs at the kennel, and consider the range of the stomach's capacity from a state of health to the highest degree of disease, to be from two to eight gallons, or from sixteen to sixty-four pounds. The capacity of the large bowels is generally proportionate to that of the stomach. I have never measured them, but after examining a great number, consider the range to be from ten to twenty gallons. I once examined a horse that died of the fret or colic, and found his bowels so enormously loaded (and his stomach also pretty full), that I was induced to enquire how the horse had been fed. The man who had the care of him informed me that the night before the horse was taken ill, he put, as near as he could judge, three quarters of a hundred of hay in the rack for two cart horses, and that he had given this horse, in addition to a share of this allowance, about half a peck of barley: this appeared to be the usual allowance for the two horses. Horses that eat so much acquire a permanent enlargement of stomach and bowels, and a constant craving for water as well as food, generally pre-

ferring dirty or muddy water, and seldom refusing the most filthy. I know now a team of cart horses, at Wells, that are allowed to eat as much hay and drink as much water as they like. The pond at which they drink is formed by the rain which flows from the roof of the stable, and from the court, where there is a large dung heap constantly kept, the drain of which flows into the pond. The water is always of a dark or dung colour, like an infusion of horse dung, and would be found, I should think, excellent manure. Mr. Garrod, the proprietor, assured me that his waggoner had repeatedly tried to make them drink at a running stream about a mile from Wells, when they were returning from a journey and thirsty, but they always refused; yet as soon as they got home, and were permitted to go to this filthy pond, they drank with the greatest avidity.

In a letter from my friend Mr. Joseph Bomedge, jun. he says, "I think you are right in introducing into your compendium of Cattle Medicine some remarks on the importance of giving wholesome water to cattle. Doctor Jenner thinks that the public cannot be too often reminded of the beneficial consequences of such practice. Mr. ——, of Wolverly, a most respectable land proprietor, informs me that his farm horses frequently become broken-winded, which

he attributes to their drinking impure water. They are always taken to a fine spring, where they drink as much as they like; but in his yard there is a stagnant pond into which runs all the urine, &c. from the stable, which makes the water appear of a dark colour. It is noticed that the horses greatly prefer this water to that of the spring, and they invariably on their returning from the spring to the stable yard drink freely of it. His neighbour's teams, that are in every respect fed and worked in the same manner, save their not drinking foul water, are remarkably healthy and free from broken wind." I am of a different opinion from my friend with regard to the effect of foul water upon the wind of horses, and attribute their preference for it to a morbid and enlarged stomach from eating immoderately of hay. None of Mr. Garrod's team were broken-winded, nor had they any disease; but they had large bellies, rough harsh coats, and itching legs; their dung and urine were very foul, and the stable was absolutely stinking. To milch cows, stagnant pond water, which in dry weather is strongly impregnated with their excrement, certainly does harm. It lowers the quality both of the butter and cheese, and sometimes causes abortion. See my Compendium of Cattle Medicine, in which are some circumstances and remarks which I communi-

cated to the Bath Agricultural Society on this subject.

In a state of nature, and even in his domesticated state, under good management, the horse has a moderate and a very delicate appetite, and is very nice in his choice, both of food and water. I have seen a large stud of horses that were kept in the highest condition on an allowance of eight pounds of hay in the day and night, and five quarterns of corn. Horses so fed will not drink much water,—perhaps from two to four gallons in the day and night: while one that has acquired a voracious and depraved appetite, has been known to drink four pailfuls at a time, that is, from twelve to sixteen gallons, and eat from thirty to forty pounds of hay in a day and night. With such a load in the stomach and bowels, what can be expected but an abridgment of the animal's life and services to one third of the period to which they might have been extended under proper management; and his labour during this short period is often interrupted by sickness. Besides this, we are to consider the loss of muscular power that must result from such immoderate feeding; also the loss of spirit or energy, rendering a horse sluggish, sleepy, and unwilling to work. The blood, too, gradually becomes impoverished and full of humours, as it is termed: the bowels

loaded with worms, and the air passages with viscid or acrimonious mucus, causing wheezing, and difficult breathing and cough: and to add to this catalogue of evils, the horse often becomes mangy, greasy, farcied, and consumptive. I believe many horses have been thrown down merely from the sluggishness and weakness occasioned by loaded bowels;* and whenever the gripes, cholic, or fret, terminates in inflammation of the bowels and death, as it often does, we are sure to find the stomach or bowels, or both, in a loaded state.

I have examined horses at the kennel that have been brought to the dreadful condition I have described by improper feeding, and other improper treatment: they were affected with mange and grease in a most loathsome degree. In every part of the bowels there were worms, the belly was dropsical, the mesenteric glands obstructed, the blood watery, and scarcely capable of coagulating; the brain soft, and smaller than in a healthy horse; and in one horse an immense number of bluish or dark-coloured

* A few days since a gentleman's carriage horse was brought to me, that had become a roarer, and appeared to be asthmatic, or touched in the wind, and entirely, I believe, from being kept on dry, dusty hay that was three years old; of this he ate without restraint, and was permitted to drink freely.

worms, about one inch in length, were found in the integuments of the abdomen or belly. They had not penetrated the peritonæum or the skin, but appeared to be confined to the cellular texture or membrane, which was considerably thickened and diseased. It is very generally believed that muddy pond water, especially when there is a clay or chalk bottom, is more congenial with a horse's stomach than clear or running water. Horses frequently prefer such water, and this preference may sometimes be the effect of habit in some degree, but more frequently, I believe, of an enlarged stomach, and a morbid state of the organ. And when we consider that almost all clays, and perhaps ths mud of roads, contain more or less of finely pulverized carbonate of lime, such water may relieve a painful sensation in the stomach and bowels, by neutralizing some acidity contained in them, for almost all horses eat a great deal more hay than is proper, and many will eat even their litter, therefore it is not unlikely that an acidity may often exist in the stomach and bowels of horses. Two rabbits were fed with parsley, one of them had only a small quantity, the other was suffered to eat a great deal. They were killed soon after, and their stomachs were examined. In the first, a perfect digestion had taken place; in the second,

the stomach was full of the parsley, the juice of which had been forced into the first of the small intestines, and had there become acid. This experiment proves that by distending the stomach with food we interrupt digestion, and that in consequence an acid is formed. It is difficult, perhaps, to determine whether under-feeding or over-feeding does most mischief in cattle, as well as in horses. Horses in this country are often worked so immoderately that they can scarcely eat sufficient food to repair the different organs of the body; for the digestive power of the most vigorous stomach is limited, and if an animal is induced to eat more, even of the best of food, than the stomach can easily digest, it tends to depress or weaken the organ. How seldom do those whose business or amusement it is to fatten animals, reflect upon this circumstance! To give them as much of the best food as they can eat is the only thing thought necessary. They scarcely ever consider that food cannot do any good unless it is perfectly digested; and that a perfect digestion cannot be expected unless the stomach and bowels are in a healthy state.

Now with regard to horses, the stomach is often injured, both as a muscular and as a nervous organ, by immoderate work, and by exposure to cold and wet at a time when the

strength of the body is exhausted by exertion, and the skin is in a perspiring state; therefore attention to feeding alone is not sufficient to preserve the health of the stomach; but with respect to animals that are designed for food, and especially pigs, this is not the case. Thousands of these animals are lost from improper feeding, and consequent constipation of the bowels, which brings on a fatal inflammation of the lungs, and frequently of other internal parts.

The same may be observed of cattle, especially yearlings, which are kept hard during the winter, and put suddenly into rich pasture in the spring. But though the horse's stomach cannot be preserved in health by attention to feeding alone, we have this consolation, that it is only by working him unfairly and cruelly that we injure the stomach when it is properly supplied with food; and that by working a horse with moderation, and treating him in every respect with kindness, we are not only doing our duty as Christians, but promoting our interest as horse proprietors. The state of the bowels has more to do with the digestive function than is commonly supposed, not so much, perhaps, as in the human body, or in that of pigs and dogs, but in a sufficient degree to require our attention. Dr. Hamilton, in his excellent work on purgative medi-

cines, a work that is universally allowed, I believe, by the medical profession to be one of the best and most useful that ever was written, in speaking of costiveness, or an accumulation of excrement in the bowels, observes, "I have learned that the due regulation of the alvine discharge (stools) constitutes much of the prophylactic (preventive) part of medicine, and teaches the propriety of advising those who wish to preserve good health, or to recover it when it is impaired, to attend carefully to this circumstance. In this view it may be proper, on some occasions, to counsel the valetudinarian to forsake the haunts of fashionable life; to quit the crowded city, alluring amusements, and various occupations carried on in airless, or even in tainted rooms; to shun luxurious tables, indolence, and late hours; to retrace the steps by which he has deviated from simple nature; and to court the country, pure air, and simple diet. It may not be convenient, however, at all times to follow this advice; and though followed, it will not always remove constipation and its attendant evils. In this event, as well as in those cases where constipation induces or accompanies disease, the use of purgative medicines becomes absolutely necessary." It is nearly the same with horses. Horse proprietors, it is true, may pre-

vent the animal from eating and drinking improperly, or from doing any thing which may injure his health, but veterinary surgeons cannot always prevail upon proprietors to feed them properly, keep them in wholesome stables, and work them with moderation; we are, therefore, frequently under the necessity of giving purgatives and other medicines. It may be useful, however, to know that constipation of the bowels of horses may generally be relieved by a few bran mashes, a little green food, or a clyster composed of a gallon of water, or more, with a handful or half a pound of common salt dissolved in it. In some cases, it may be necessary to give a ball composed of four or five drams of aloes, two or three drams of soap, and a dram of ginger. This, with a clyster the following morning, will seldom fail of procuring a sufficient evacuation from the bowels. Whenever this mild purgative is employed, the horse should be allowed two or three days' rest,—that is, from labour, but not from salutary exercise.

A change of diet sometimes does much good, especially in the spring; vetches at that period eaten for three or four weeks will strengthen the stomach, purify the blood, and invigorate the whole system. Beans should never be given to horses without being bruised, or ground, and only when a horse works hard. Bad hay is

dear at any price, and indifferent hay is more fit for litter than for food; the best is by far the cheapest, however it may exceed in price that of indifferent quality. The same may be said of oats; I have seen serious disorders produced in hard working horses by the use of bad oats. Pure water is certainly better for horses than any other, though many, and perhaps most horses, feel a preference for turbid pond water. This preference, however, is not to be considered as an indication of its salubrity, unless we consider it in a medicinal point of view. The manner in which horses are commonly fed is apt to deprave or vitiate the appetite, and probably cause some degree of acidity in the stomach and bowels. This is the only way in which I can account for the propensity so common in horses to drink muddy water, and eat earth or dirt of any kind. Mr. Feron, in his "Treatise on Farriery," says, "Horses at camp are very apt to eat earth or sand;" and that he has "opened horses that have died from this cause, and found nearly two buckets of sand in the large bowels, named colon and cæcum." Whenever this propensity is observed in a horse, a small knob of clay should be mixed with his water; but this will only afford a temporary relief, the propensity can only be cured by a mild dose of physic, and a change of

of diet. Though horses are often permitted to indulge this propensity because the groom or the proprietor does not perceive any ill effect immediately resulting from it; yet it is always sooner or later productive of ill consequences. It may indeed neutralize some acidity in the stomach and bowels, caused by immoderate or unwholesome feeding, and thereby do a little good for some time; but then it is only protracting a disorder for a short time, which such feeding is sure sooner or later to bring on. Disorders of this kind may be very slow in their accession and in their progress, and on that account may escape notice for a considerable time, and when they do appear are generally referred to some other cause. The same may be observed of disorders produced by pond water impregnated with excrement.

It is a very common opinion that the water an animal prefers must be the best for him: and were its appetite consulted when in a state of nature, this rule might be safely followed; but as horses are at present managed, it is generally necessary to choose for them, with regard both to food and water. In speaking of a state of nature, I must be understood in the strict meaning of that word: I mean animals in a wild state: for many of our fields are now so highly cultivated, and the artificial grasses

are now so common, that apoplexy, inflammations, and other disorders arising from repletion of the blood-vessels, are often happening at grass. When a horse is first turned out, he should be put into a field where the grass is short: for when either horses or cattle are turned into good pasture in the spring, or early part of summer, they often injure themselves by eating too much; and in dry weather the stagnant water of ponds, which is always more or less impregnated with excrement, will often cause abortion in cows, and other disorders. (See the Author's "Compendium of Cattle Medicine.") I cannot conclude this subject without adverting to a circumstance which breeders, both of horses and cattle, would find great advantage in attending to, and that is—the well ascertained fact that *weakness of the digestive system of the lungs, of the feet and eyes, of the constitution generally, and likewise restiveness or bad temper, are in some degree hereditary. That, however careful we may be in the choice of stock for breeding; the digestive system, or the constitution of the young animal, may be irrecoverably injured by improper treatment during the time of rearing; and in young horses, by breaking them and bringing them into work too early, especially when the manner in which they are broke, and their work, are unsuitable to their age and temper.*

CHAPTER VI.

ON LOSS OF APPETITE.

Want of appetite is more frequently complained of in horses than an excessive or craving appetite: this, indeed, so far from being complained of, is generally considered a desirable qualification in the animal; but, as I have before observed, more diseases arise from this cause than from want of appetite. A distinction, however, must be made between an excessive or voracious appetite and a hearty and healthy appetite. The latter is denoted by the horse being ready for, or desirous of, food, as soon as he comes in from a journey, and eating his allowance with an evident relish. The former by an almost constant craving for food and water, without any regard to the quality of either. In weakness of appetite a horse is rather indifferent about food when he comes in from a journey, and will only eat such as is of good quality. He feeds slowly and languidly, especially if he has been ridden at all hard. In this case, he often refuses his food for some time, and if any cold water is given him, is attacked with shivering, and sometimes with looseness and colic.

Delicacy or weakness of appetite is often constitutional, and the effect of being kept hard when a colt, or of being kept in cold wet situations; it may be also hereditary. Sometimes it is brought on by too early and immoderate work, and inattention in regard to feeding. In all these cases the horse's work, especially with regard to the place he is ridden at, the quality of his food, the temperature of his water, and all those attentions which constitute good grooming, must be constantly observed. When such a horse happens to be worked harder than usual, the extra labour must be compensated for by extra attention: his water should have the chill taken off, and if a handful of fine wheat flour were stirred into it, it would be still better, especially if the bowels are rather loose. A cordial ball may be useful on such occasions, or a moderate dose of warm ale. Young horses, however, seldom derive that benefit from cordials and ale that older horses do, and particularly those which are accustomed to such treatment. The most effectual and the most innocent restorative is rest; for which in summer a field is the best situation: but if, during the time of rest, the horse be kept in a stable, his diet must be carefully attended to. This should be rather opening, and such as the horse appears to relish: vetches or other green food,

are perhaps the best. Good sweet bran is an excellent thing to keep the bowels cool and open, and may be rendered nutritious in almost any degree by the addition of good fresh bruised oats or malt. A small quantity of good sweet and clean oats thrown into the manger now and then will often induce a horse to feed when there is want of appetite; and a very small quantity of the sweetest hay, given occasionally, is generally eaten with great relish.

Young horses often fall off in their appetites during the time of cutting teeth. At this period there is often a soreness of the mouth, in which the mucous membrane of the stomach and bowels seems to participate. In such cases the want of appetite is generally attributed to the lampas, or a swelling or fulness in the roof of the mouth, adjoining the front teeth; because the horse is sometimes observed to mangle his hay, as it is termed, that is, he pulls it out of the rack, and after chewing it a little while, throws it out again. The common remedy, if such it may be called, is the application of a red-hot iron to the part, and burning out the prominent part or lampas; but this is never necessary. All young horses have that fulness in the roof of the mouth which is named lampas; and it never interferes with their appetite or the chewing or gathering of their food: there may, however, be some degree of tenderness about the

gums at the time of teething, when soft food, such as bran mashes, should be given for a few days; and as the stomach and bowels are sometimes affected also, a little nitre may be given in the mashes, and an emollient clyster thrown up. When there is costiveness, or slimy dung, a laxative drench may be given also, composed of 4 oz. Epsom salt; 2 drams of carbonate of soda; 1 pint of warm water; and 4 oz. of castor oil.

If the mouth appears very tender or sore, it may be washed or syringed with a lotion, composed of alum, honey, and water. Keeping a horse on new oats or new hay is often followed by some derangement of the stomach and bowels, indicated by looseness and want of appetite, and sometimes by excessive staling also, with considerable thirst, and a staring coat. A change of diet is in such cases the most essential thing; but it is often necessary also to give some tonic medicine, or a warm laxative, such as three or four drams of aloes, three drams of soap, and a dram or two of ginger, with a few drops of oil of caraway. Horses sometimes fall off in appetite merely from loading their bowels, or from staying in the stable idle too long. In this case an abstemious diet, principally of bran mashes or grass, and a clyster, are necessary, and if that fail a mild dose of physic should be given.

CHAPTER VII.

EXCESSIVE APPETITE.--VORACIOUS OR CRAVING APPETITE.—VITIATED OR DEPRAVED APPETITE.

These are all different degrees of the same morbid condition, and the origin of many diseases. The distinction pointed out in the foregoing chapter between a strong healthy appetite and an inordinate or craving appetite, must be still kept in view. I have there stated that a strong healthy appetite is denoted by a horse being always ready for his food as soon as he comes in from his work, even if it be rather harder than usual. But there are other circumstances connected with such an appetite which must now be considered: a good feeder, as such horses are termed, does his work well and with spirit. He is seldom craving for water, if properly supplied with corn; he eats only moderately of hay; he carries a good carcase, as it is termed, and is not drawn up towards the flanks, or let down in the belly like a cow; his dung is solid, and not slimy, soft, and stinking; he does not break wind much, or stale very largely, and his urine is not foul and stinking. But a horse with a voracious and depraved ap-

petite has all these defects; he does his work languidly and unwillingly, and is eager for water whenever he sees a pond, however filthy it may be. This disease, for such it really is, is not always curable; yet the state of the stomach, and consequently of the whole body, may always be greatly improved, and the horse's life and services considerably prolonged. There is more difficulty in accomplishing this when the disease is of long standing, or acquired by hard keep when a colt, or derived from the sire or dam. Bran is an excellent diet for such horses, with a moderate quantity of *good* hay. A small quantity of oats may be given now and then, according to the horse's work. When only a small quantity of oats is thrown into the manger, they are eaten with greater relish, and are more perfectly digested. A mild dose of physic is often useful, and afterwards a few tonic balls. (See vol. ii.) In summer a run at grass will do good; but the horse must not be turned at first into good pasture, where he would be able to fill his stomach quickly: short sweet grass should be chosen. When a considerable reduction is suddenly made in a horse's diet, he may feel at first dispirited and weak; therefore it should be done gradually. Professor Coleman is of opinion that a mail coach horse, which is allowed two pecks of corn a day, requires only five pounds

of hay. I once was employed to examine some mail coach horses, and found that nine horses were consuming nine hundred of hay a week, with an allowance of two pecks of corn a day each; that is, nearly sixteen pounds a day for each horse. In another coach concern, whose horses I examined, the allowance was seven hundred of hay a week for eight horses, and the same quantity of corn. In this establishment a very useful rule was uniformly adopted, which was to keep the horses without food two hours before they started. This the owners had been taught by the loss of three or four horses in consequence of working them with too much food in their stomachs, and too much dung in the large bowels, and consequently too much blood in the lungs and in the brain. I do not think, however, that a horse in regular mail work, which eats two pecks of oats a day, is capable of eating sixteen pounds of hay, and that there must have been a great deal wasted. I remarked when four of them were taken out to put to the coach, that there were some oats left in the manger, perhaps from a quarter to half a peck; so that it was evident that the allowance both of hay and oats was more than they could make use of: and if we suppose that six pounds of hay per day might have been taken from each horse for the benefit of his health,

it would have saved the proprietor three hundred of hay a week, or nearly eight tons a year.

As coach proprietors purchase horses of all ages, and consequently of various habits and appetites, also with stomachs and bowels of various capacities, and greatly diversified with regard to condition, or nervous and muscular power, they would find great advantage from attending to a horse's feeding until they are perfectly acquainted with the state of his appetite, and consequently of his stomach and digestive organs generally. This would enable them to keep their horses in the best condition, as they would soon discover an inordinate or depraved appetite, and be enabled to correct it. This, however, is scarcely ever done. The general opinion among persons concerned with horses is, that they cannot eat too much. Bad feeders, or horses with weak appetites, are sure to be found out, because they soon become unable to perform the work that is expected of them; but the effects of over-feeding are almost always attributed to other causes; and physic, cordials, bleeding, diuretics, in short, every thing, except the most simple, economical, and effectual remedy, is employed for their removal. When a horse, therefore, is observed to eat a great deal of hay, and to devour his litter if there

be no hay before him, and especially when he is found to be dull and sluggish, or thick-winded, he should be prevented from eating so much hay. This can be done, at first, by weighing out a certain quantity daily, and dividing it into three portions. If after eating his allowance he is found to eat his litter, he should be still further restrained by a muzzle. A horse belonging to the Oak-hill Brewery, being found languid and weak in his work, was left in the stables for two or three days' rest. On the second day, he was attacked with violent colic, which terminated fatally in a few hours. On opening the body, the stomach was found loaded with undigested food, and the bowels distended with excrement and air, and highly inflamed. It was evident, then, that what was intended for the horse's benefit was the cause of his death; that is, leaving him in the stable to eat and drink as much as he liked. Numerous cases of a similar kind have occurred in the course of my practice. This horse laboured under another disadvantage besides that of an immoderate appetite, there were sharp edges on his grinding teeth, which rendered mastication rather painful, and caused him to swallow some of his corn and beans unchewed.

CHAPTER VIII.

DISEASES RESULTING FROM A MORBID CONDITION OF THE STOMACH AND PARTS CONNECTED WITH IT.

1. *Yellows.*

THIS disorder takes its name from the yellowness of the eyes and mouth; the urine is high-coloured; dung small and slimy; pulse quick and sometimes very *weak*. The horse appears exceedingly weak and languid; sometimes in such a degree that he reels when led out of the stable: he eats but little, yet is generally rather thirsty. This disease generally requires, in the first place, copious bleeding, being evidently of an inflammatory nature; this is denoted by the membranes of the eye appearing red instead of yellow, and by the pulse being rather *strong*, as well as quick, and sometimes by the breathing being a little quickened. I have seen, however, the membranes of the eye exceedingly red, while the pulse was so feeble as to forbid bleeding; most commonly, however, it is otherwise; and, as a general practice, it is safer to bleed freely at first. Sometimes it is necessary to repeat the bleeding; this is generally the case when we are prevented,

by the apparent debility of the animal, from bleeding copiously at first. When the heart and the brain are oppressed with blood, there is always great stupor and debility, and generally a pulse that may lead the inexperienced to avoid bleeding; but, upon taking off a gallon of blood, the pulse, in such circumstances, will often feel stronger; and if the blood be examined after it has become cool, it will be found rather firm, and with a thick coat of buff or size on its surface. Immediately after the bleeding throw up a clyster, and give the following ball, and, six hours after the ball, the following drench, and another clyster:—

Ball.

Calomel	1 dram.
Barbadoes aloes	½ ounce.
Ginger	1½ dram.
Oil of caraways . . .	20 drops.

Castile soap and treacle enough to form the ball.

Drench.—One dose.

Epsom salt	6 ounces.
Carbonate of soda	2 drams.
Warm water	1 pint.
Castor oil	4 ounces.—Mix.

After the operation of these medicines, the horse is generally so far relieved that nothing

more is necessary to a perfect recovery than an abstemious diet, consisting chiefly of bran mashes, with a small quantity of the sweetest and best hay. When the debility is considerable, a little gruel may be given; and if the purgative effect of the medicine continue longer than one day, it should be restrained by giving a little gruel made of wheat flour, or arrow-root. This disorder happens most frequently about September or October, especially after a hot season. The various degrees in which we meet with it depends chiefly, I believe, upon its being noticed sometimes earlier than at others. At first, the symptoms are alarming; the horse appears languid and sluggish, and feeds badly; the eyes look rather dull, and upon opening the lids with the finger and thumb, the yellowness before described may be observed; the inside of the lips and gums will be found also tinged with yellow. In this stage an opening ball and an abstemious diet would be sufficient generally to effect a cure; but, if it be neglected in this stage, and if the horse be kept at work, and especially if he be ridden fast, or urged to any considerable exertion, the heart and lungs will be so oppressed with blood, that medical skill will often be found unavailing. The middle stage between these two points appears to take place when the

first is not attended to, and the horse is not worked, or only very moderately. Exposure to cold and wet may sometimes contribute to this disorder; that is, when a foundation for it has already been laid by over-feeding. See chapter v. p 29.

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2. *Colic, spasmodic or flatulent, Gripes, Fret, Botts, Gullion, &c.*

By these different names a very common disorder is known in different places; the three first are most frequently used, but the term colic, or gripes, is perhaps the best. The symptoms are restlessness (fret), pawing the litter, looking round to the flank, gathering up the hind-legs, lying down, rolling over upon the back, soon getting up again, and, after a short interval, lying down as before. The pain soon becomes more violent, the horse sweats, his belly swells, he endeavours to stale, and either feels some difficulty in voiding his urine, or is unable to void any. The pain still increases, and he can scarcely be kept upon his legs; the pulse becomes quick; the ears cold and moist; the body is covered with cold sweat; he appears to be delirious, and cannot be approached without danger; at length he becomes more tranquil for a short

time, but the pain soon returns, and then he drops down heavily, stretches himself out and dies. The most dangerous kind of colic is that which depends upon a loaded stomach; and in this the horse generally dies in a short time: the pain is more acute; the paroxysm more violent; the intermissions, if any, shorter; the pulse quick, and felt with difficulty. The next in degree of danger is that which arises from loaded bowels. In this, the horse lives longer, and the pain is less acute at first; but, unless properly treated, it always terminates fatally. The next kind is that which is most easily cured, and generally submits to the common domestic remedies, such as brandy, or gin, mixed with warm water, hot beer and ginger, laudanum, oil of turpentine, sweet spirits of nitre, &c. This kind seems to depend upon a spasmodic affection of the stomach or small intestines, and is often brought on by drinking cold water, especially if it be very hard; by eating new or heated oats, or new hay; by eating greedily, and thereby swallowing corn unchewed, and drinking immediately after; by the horse being worked at a fast pace immediately after large feed; or, by worms in the stomach or small intestines. In consequence, however, of this spasmodic affection, there is sometimes a strangulation of a coil of the small intestines, by an inflated

portion forcing itself through the mesentery, and becoming inflamed and mortified; this, however, is not a frequent occurrence. The first thing to be done is to give some anodyne or carminative medicine, such as brandy, rum, or gin, mixed with warm water, or the anodyne carminative tincture (see vol. ii. fourth edition); a clyster of salt and water is then to be thrown up; but previously to this, it is often necessary, and perhaps useful, at all times, to *rake* the horse, as it is termed; that is, to draw out the hard excrement with the hand. This operation is easy to be performed by any one. The arm is to be laid bare, the hand oiled or greased, and then forced into the dung gut, and all the dung that is within reach is to be drawn out. After this, the clyster is thrown up with more ease, and with better effect. If the horse is in good condition, he should be bled pretty freely: if the horse is not soon relieved, the clyster should be repeated, and another drench given. The belly should be well wisped, and fomented with large woollen cloths wrung out of scalding water; and, if this does not afford relief, some mustard made into a thin paste like cream should be well rubbed into the belly. When there is reason to suspect, from the manner in which the horse has been fed, from his being a greedy feeder, and other cir-

cumstances, that the bowels are loaded with excrement, the following drench should be given:

Take of Epsom salt	8 oz.
Carbonate of soda	½ oz.
Ginger	2 drams.
Warm water	1½ pint.
Castor oil	8 oz.

Mix for one dose.

In horses that have had many attacks of colic, I have seen 4 oz. of oil of turpentine in a little warm water afford relief after the anodyne carminative tincture had failed. This remedy is preferred by Professor Coleman to all others. I am unwilling, however, to give such powerful stimulants, if a cure can be accomplished by more gentle means; yet I believe it is the remedy very generally employed in the army. Mr. Bracey Clark strongly recommends a tincture of allspice in proof spirit or brandy, and considers the flatulent colic as depending almost always on indigestion. I have examined many horses that have died of this disease, that is, by its terminating in inflammation; and am of opinion, that it frequently depends upon a loaded stomach or loaded bowels. In either case some carminative medicine is necessary: but to prevent a recurrence of the disease the load must

be removed from the stomach or bowels. Clysters of salt and water certainly act upon the large bowels named colon and cæcum; for, if they do not actually pass into those bowels, the impression made upon the nerves of the rectum is certainly propagated upwards, or rather forwards, and causes an evacuation of all the large bowels. Whenever it is suspected that drinking hard water is the cause of colic, working up a small knob of clay with the water, or stirring in a little powdered chalk, and taking off the chill of the water, will be found useful.

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3. *Worms.*

Worms appear to be engendered in the bowels, in consequence of a morbid state of the digestive organs; for, as the same food which produces worms in one horse will not do so in another, this is but a reasonable inference, and directs us both to the prevention and the radical cure of the evil. The stomach and bowels are not the only parts in which worms are found; they have frequently been seen in the mesenteric artery, in the windpipe, in an abscess, and in India in the aqueous humour of the eye. I have now one of these worms: it is a very slender thread-like worm, rather more than half an

inch in length: from these circumstances it is evident that worms, or the eggs of worms, get even into the blood. I have thought that worms, or their eggs, may sometimes be deposited upon the mucous membrane of the bowels, with the mucous matter secreted on that part; but whether worms be thus deposited with the mucous secretion of the bowels, or engendered in the food during its passage through the bowels, the means of cure and prevention are the same; for if the blood is the source of the worms, how can it be effectually purified and brought to a healthy state but by strengthening the digestive organs, and supplying the animal with wholesome food? and with regard to the former, nothing can be done until the worms with their mucous habitation be swept off; until this is accomplished the latter will avail nothing.

To effect this a variety of means have been proposed, and probably all of them have sometimes succeeded. Mercurial physic seems to be generally considered the most effectual, especially when a little calomel is given for two or three successive nights, and followed up by a dose of physic. I have seen small doses of aloes given daily, about 2 drams, with good effect. Oil of turpentine is a powerful vermifuge, if given after some hours' fasting, and when the bowels have been brought into a lax

state by giving bran mashes for two or three days, or a small dose (about three drams) of aloes the day before.

This previous fasting, as well as keeping the horse without food two hours after, is necessary to the success of this remedy. In a few instances, oil of turpentine has produced alarming symptoms; and, in one case, where a horse had taken a mild dose of physic the day before, it brought on almost immediately a fatal inflammation of the stomach and bowels. On the other hand, a great number of cases have been reported to me in which it has been given with the best effect. I should be inclined, however, to try the mercurial purgative first; but even this, in the horse, is attended with some danger, unless he is managed judiciously before, and during this operation. The third remedy is of a milder nature, but often, I believe, inert; that is, bitter vegetables, such as rue, box, savine, &c. which are chopped up and given with the horse's corn. Ethiop mineral, levigated antimony, emetic tartar, very small doses of arsenic and calomel, have each of them sometimes succeeded. But, whatever worm medicine is given, the horse should be kept without food for several hours, or the whole night before, and two hours after. Chopped horse hair has been given with success, and brine, or a solution of

common salt. In one case a great number of worms were discharged by fasting the horse during the night, and giving him a malt mash in the morning. Another method is to keep the horse without food during the night, and give him in the morning a quart of new milk sweetened with honey, and about ten minutes after, four, five, or six ounces of salt in a quart of water. A run at grass in the spring is, perhaps, the best remedy of all, for it is the most effectual means of invigorating the digestive organs, and purifying the blood. When it is not convenient to turn the horse out, he should be soiled in the stable with vetches. The most certain indication of worms, except that of their being discharged with the horse's dung, is a yellowish or brimstone coloured stain under the fundament. Sometimes worms produce symptoms of an unusual kind, as in the following case:—A horse was observed for some time to fall off in flesh and become weak, and, upon attempting to mount him, he shrunk and gave way so in the back, as if he had received some severe injury in that part: they gave him, however, a dose of mercurial physic, which brought off a lump of worms and viscid mucus as large as a man's fist. After this the horse was perfectly free from pain in the back, and quickly recovered his flesh and strength.

I have heard of a horse being cured of worms, when reduced by them to such a degree of weakness that he was thought incurable, by being turned into a field of young vetches. Powdered tin has been recommended for worms, and may be given without danger in a dose of three or four drams made into a ball with flour and honey. With regard to the short red worms, named botts, so often found in the horse's stomach, adhering in large clusters, most commonly to the insensible coat, but sometimes to the pylorus, the most likely means of expelling them is to give a drench of salt and water in the manner before prescribed; that is, to keep the horse without food during the night, and in the morning to give him a quart of new milk sweetened with honey; about ten minutes after this drench is down, the drench of salt and water is to be given. This remedy should be employed in September, or soon after a horse is taken from grass. Botts are so often found in the horse's stomach, that they have been supposed to do no harm: it is certain, however, that they sometimes produce the most serious diseases. They sometimes cause ulceration and sloughing of the stomach, inflammation of the lungs and heart, and phrenzy or mad staggers. According to Gibson, they sometimes cause locked jaw. Botts

appear to be the larvæ of a fly, and are probably eaten with grass or hay. According to Mr. Bracy Clark, the fly deposits its eggs on the horse's coat; and when they are about to be hatched, the horse licks them off, so that they are hatched by the warmth of the mouth and the moisture of the saliva, and then swallowed. Mr. Feron says he has paid particular attention to this subject, and has found that, when in large quantities, they are very destructive to horses; that he has seen several horses whose stomachs had been pierced quite through by them, the botts making their way into the abdomen. He thinks they are taken in with the horse's forage, whether dry or green, as they are found in horses that have not been at grass for several years, but that they may also be licked in from his coat. He is of opinion that botts, when once attached to the stomach, may remain there during the horse's life, and it is only when they become too numerous that they are forced off and discharged by the bowels.* Mr. James Clarke

* I have known an instance of a bott becoming a fly when it has been discharged with the horse's dung, or taken off when found sticking to the fundament; but I have several times kept botts that I have taken from the stomach of a horse slaughtered at the kennel, when the larvæ appeared to be mature, but they did not become

relates a case of a horse's stomach being perforated by botts. I have seen several horses destroyed by those worms. In some of them, they caused inflammation of the lungs; in one phrenzy, or mad staggers; and in one horse, the pylorus was completely plugged up with them. There is a remarkable sympathy or consent between the stomach and the lungs, and it is owing to this that they sometimes cause inflammation of the lungs. In the cases which have occurred in my practice, the most remarkable circumstance was the great depression they occasioned, and the inefficacy of copious bleeding. Castor oil seemed to do more good than any thing, and Mr. Feron remarks that common oil, given in large quantities, has sometimes succeeded in detaching botts from the stomach; and he adds, it is the only medicine that seems

flies. From this, as well as from the circumstance of their being found in an apparently mature state, at all times of the year, I am inclined to think Mr. Feron's opinion correct. But whether they are detached at times, from becoming too numerous, or from the motion of the food in the stomach, is uncertain. When we find that botts may be kept alive in oil of turpentine, and even in a concentrated solution of sublimate in muriatic acid, we cannot expect to poison them in the stomach. The only chance there is of detaching them seems to be that of blowing them up when excessively hungry, with the milk and honey, and then sweeping them off with the salt and water.

to have any effect in making them loose their hold from that organ. There is a kind of worm I have often met with since I have practised in Somersetshire, especially at Oakhill, which appears to do a great deal of mischief. When drawn out, they are from one to three or four inches in length, from one to two eighths of an inch in breadth, and scarcely of any thickness; th have numerous transverse lines close to each other, like those of the leech, and adhere firmly to the bowels by one of their extremities. When viewed through a microscope, the transverse lines appear as upright scales applied very near to each other, and inclining, I think, a little forwards; the extremity, by which they adhere to the gut, appears as a bulb with holes in it; the other extremity is square, as if it had been cut off transversely. These worms are generally of a white colour, and sometimes drawn up or contracted so as to appear as a flake of mucus, or fat, of about half an inch in length. I have seen them of a darker colour in horses that were in a state of great poverty, and sometimes reddish, as if containing blood. In many dogs and cats that have been opened at Oakhill, they have been almost invariably found; and they have been discharged, in this village, from the bowels of men and children. They are found both in the small

and large bowels, most commonly in the former, and near the part where the ilium terminates in the cœcum. At Easton, near Wells, this worm has been seen swimming in a small stream that runs through the village, from which it is probable that their natural habitation is water, and that they are swallowed while the animal is drinking, and are capable of living in the bowels.

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4. *Stomach Staggers. Weakness or Palsy of the Stomach.*

The symptoms of stomach staggers are drowsiness, hanging the head in the manger, and loss of appetite. The membranes of the eye are deeply tinged with yellow, or rather of a reddish yellow, or orange colour. There is a slight convulsive motion or twitching of the muscles of the chest; the fore legs appear at times to give way, as if the horse would fall; but this rarely happens, and he seldom lies down unless the disease is going off, or death is approaching. The urine, if any, is scanty, and high-coloured. The dung, if any, in small knobs, and slimy. The pulse is seldom much affected until the latter period of the disease· Sometimes there is a retention of urine, from

the bladder becoming paralytic; and in the latter stages the jaws are sometimes locked, and there are sometimes cold sweats, and a palsy of one side of the body. I have often observed in the early stage of the disease that the horse seems to be roused, and neighs, on a person first entering the stable, but soon relapses into a drowsiness or stupor, boring his head against the wall or the manger, or endeavouring to force his nose through the rack-staves. When a horse is attacked at grass (a situation in which it often occurs, especially at the latter part of the year, in low marshy situations, or near rivers, where the grass is rank and abundant), he is generally found forcing his head against the hedge, or in a ditch; and if taken from this situation, he moves forward rambling, as if in constant danger of falling, until he meets with some obstacle, against which he forces his head so as to cause sometimes considerable swelling over the eyes, and other prominent parts. He often appears quite insensible; but there is never that violent delirium as in phrenzy or mad staggers, nor is there any difficulty in bleeding or performing an operation, except giving a ball or drench, which is sometimes very difficult. A disease resembling stomach staggers has occurred at times in the neighbourhood of Swansea, and proved very destructive. The follow-

ing is a copy of a letter I received from a very intelligent gentleman on the subject:—

"SIR,

"Permit me, though a stranger, to address some observations to you on a disease which you have described under the name of Stomach Staggers in your 1st vol. or Compendium of the Veterinary Art. I have never seen any mention of it in any other treatise before, though I have seen it rage with the most destructive violence in the neighbourhood of Swansea, in Glamorganshire, where it is called the distemper. For a long series of years it has been the object of inquiry, but it has never been investigated on the spot by any one having a scientific knowledge of the diseases of horses, except Mr. Rickwood, of Brighton, who was sent down some years ago, when the disease raged most violently, by a gentleman who owned a very large number of horses; but he was not successful. Permit me now to say, that I do not think you have seen the disease raging with the violence, or to the extent, it has frequently done near Swansea. Its commencement is dreaded like the plague. The symptoms you mention are exactly such as occur; and the distinction you point out between the brain staggers and stomach staggers is correct; for

though the yellowness of the eyes and mouth has generally escaped observation, I have a memorandum particularly noticing that a man, in giving a ball to a horse in this disorder, had his hand tinged quite yellow, and I have no doubt it generally occurs. But besides the symptoms you mention, the animal is subjected to a general convulsive affection; frequently attempts to stale, and discharges a little urine at a time, by shoots, as if convulsed, and most commonly the animal's jaw is locked some time previous to his death.

"Having now stated the immediate symptoms, I will give a succinct history of the disorder as it appeared, or rather raged, near Swansea. The earliest account I have of any particulars begins about the year 1782, but I know it has at times visited the neighbourhood ever since the year 1760. It generally begins to rage between July and the end of September; the cold weather in winter has generally stopped it; but the last visit it made us it continued two entire years. In one year a neighbour of our's lost more than a hundred horses by it, and the next year we lost about thirty. It attacks both sexes and every age indiscriminately; but animals at grass, in high condition, and at easy or no work, appear to be most subject to it, and to have it with more violence. Till the time it

visited us, animals kept in a stable were considered as protected from it. Horses kept in the mines under ground had never had it. I made a stable in one of our under-ground works, to remove all our horses, but before I carried this plan into effect the disease began to decline. At the height of the disorder horses seldom or never recover. When an animal does recover it is considered as a favourable prognostic, and we look for a delivery from this plague. The animals at grass are most liable to it; but such as are kept in a stable, under the best management, are also subject to the disorder. In the year 1801, when it last raged with us, I lost a valuable horse that was perfectly well groomed; but I shall have to make some observations on his case when I mention the dissections, and the apprehensions I have of the disorder being contagious, which I shall now proceed to do. The appearance and state of the stomach are, generally, such as you have described; but in the valuable horse before-mentioned, and a few others which died of this disorder, this was not the case. I beg here to observe that I had been very strict in my stable regimen, and particularly in the quantity, quality, and time of giving food and water; and I attribute the emptiness of the stomach to this cause. Though I did not prevent the disease by this precaution,

it made all the symptoms milder. I am not a surgeon or a scientific man, but in examining the bodies of horses after death I have been assisted by a surgeon, and have generally found, with the exception of the loaded stomach, and a slight inflammation for a small length below the pylorus, and sometimes a little repletion of the vessels of the brain, every part free from disease. I could not for a long time believe that the disease was contagious, but now fear it is highly so; yet do not think this circumstance has been proved. When the disorder last began, a neighbour who had lost a great many horses by it sent a parcel of their skins to a neighbouring town to be sold. The horses that drew the waggon in which they were conveyed were the next—and that in a short space of time, which fell victims to the disorder. Horses that had been in the stables where the disorder raged were sent to work under ground: there also the disorder soon after made its appearance for the first time. Our neighbours firmly believe it is contagious. They took every precaution to prevent contagion, and the disease left them. I was incredulous, and at that time we had not suffered. A horse from their neighbourhood came to graze in some fields through which some of our horses passed; he died of this disorder, and was left unburied. From this mo-

ment the distemper began with us; but not knowing the circumstance of the horse remaining unburied, I took no precaution to prevent contagion. The valuable horse before-mentioned was taken ill the next day, and soon died. He had been at a neighbouring fair, and was left with a man to hold while I did my business. I do not know that he had any communication with other horses, but suppose he must. The common farmer's horses in this neighbourhood are all badly managed, yet I have known those who take proper care of their horses, who do not overwork them, and even those who keep them at grass, lose all their horses, when their less careful neighbours lose none. I have known a man lose his whole stock twice in one year. When I began to fear contagion, every horse that died of the distemper was buried without being skinned. We have had no return these five years."

According to the observations of a surgeon who had many opportunities of seeing the disease at Swansea, and examining the bodies of horses that died of it, the symptoms of stomach staggers at that place are, heaviness, stupor, laziness at work, swinging the head from side to side, or pushing it forward, or resting it in the manger, but never turning it round or drawing it backwards, often standing for hours motion-

less, then slight twitches of the limbs, and other parts of the body: they seem weak too, and afraid of falling. There is a heaving of the flanks, the ears are cold, the eyes glassy: some grow immediately stiff, and the jaw is frequently locked: some beat their heads about, and kick out at every thing, but are never observed to kick their bellies, as in gripes. The first symptoms, beating the head against the ground or manger, increase: they often force the nose through the bars of the hay-racks; the jaw becomes closely locked; they fall; the twitching increases; violent perspiration breaks out in some; in others the skin is dry and tight; and the eyes open and staring, yet the horse appears to be blind. He makes water frequently, which is forced out as if by a general spasm.

Fatal Symptoms.

The coldness and stiffness of the whole body increase; the loins become extremely pinched in; the eyes very glassy; the jaws closely locked; and the dung very hard and dry.

Symptoms of Recovery.

Very few recovered: in these the coldness of the ears and body lessened; the jaws became relaxed; convulsions abated; the eye appeared more lively; staling less frequent, and without

appearance of spasm. They attempted to eat and drink; and the dung became moister and of a light colour. Out of fourscore only four were supposed to have recovered; and one of these, on being turned out, ran round the field several times, then fell and died. Another seemed to have been relieved by *profuse bleeding*.

The disease is not discovered till the case is become desperate, and then it usually kills in twenty or thirty hours. Almost every remedy has been tried; viz. *bleeding*, (query, to what extent? was it copious or *profuse*?) hot baths, calomel, purging medicine, salts, opium, camphor, James's powder, and asafœtida; none of them appeared to be of service.

Six horses that died of this distemper were examined by this gentleman. "In four of them the stomach was loaded and much distended. In one the stomach was nearly empty; but the large bowels were much loaded. In the sixth the large intestines were loaded, and the rectum was full of hard dung: but the stomach was not much distended with food. In all of them the lower part of the stomach was more or less inflamed; and in some the intestines also, as well as the membrane which covers them, and by which they are connected together."

From the foregoing observations, it is evident that the Swansea distemper is the stomach

staggers in a more acute form than I have generally seen it; and this probably depended on the horses being kept in good condition and full of blood. It seems to have occurred most commonly at grass, when the pasture was abundant and very nutritious: for though in one year, 1800, the summer was remarkably dry, yet in meadows that had been well watered, the little grass there was, or even the roots, were exceedingly nutritious; which is evident from horses getting so fat as they are found to do in such pastures, and at such seasons.

In 1786, the first time any accurate account has been kept of this occurrence, though the disease had been traced back to the year 1760, the summer was wet, and it then began in June and continued during July, August, and September. In 1787 it began in July, and continued during August, September, and great part of October. In this year the spring was wet; but the summer warm, and there was a very luxuriant crop of after grass. In 1800 the summer was unusually dry and hot; great crops of hay, but no after grass.

It should be observed, that "Animals at grass, *in high condition, and at easy or no work, appear to be most subject to it, and to have it with more violence:*" that "it generally rages between July and the end of September," and

that "the cold weather has generally stopped it." The same writer says also, in another letter, "I have mentioned our horses being attacked the year following our neighbour's great loss, and when they were free from it: now most of our horses were purposely kept in the stable, and I have some idea they were fed upon hay of the same year that our neighbour's horses were fed upon the preceding year: could this be ascertained, it might lead to a discovery of the real cause of the distemper." I perfectly agree with my intelligent correspondent in this opinion; and if the hay was made in the fine dry summer of 1800, when the crops are stated to have been so luxuriant, the cause appears to me very evident. With regard to the opinion of its being contagious, it is not so easy to determine; nor is it so necessary, for it is always advisable on such occasions to act as if it really were so, and above all to bury the dead animals immediately, skin and all, to a considerable depth. The conclusion of the gentleman's letter is sufficient to show the propriety of this advice. "When I began to fear contagion," he says, "every horse that died of the distemper was buried without being skinned, and we have had no return these five years."

Whether the poison which produces this disease be contagious effluvia, or arises from luxu-

rious feeding, it is evident from dissection that the stomach was the injured organ; and that if, by the unusual strength of the stomach, or by the medicine which was given, the load was removed from that organ, the great bowels were found loaded; "and sometimes there was a little repletion in the vessels of the brain." One was relieved (recovered) by "*profuse bleeding*." Now, though bleeding is mentioned as one of the remedies employed, it is not said in what manner they were bled—probably it was in the common way; that is, about two or three quarts were taken off: whereas, by profuse bleeding, I should suppose two gallons at least. I have known more than four gallons of blood taken from a horse in about an hour, with success. Mr. Rogers, of Exeter, informed me that he took five gallons from a horse in brain staggers or phrenzy in the course of two or three hours, and the horse recovered. Mr. Coleman states, in his Lectures, that 44 lbs. have been taken at one time. It appears to me that the Swansea distemper depended upon repletion of the blood-vessels, as well as of the stomach and bowels, and should have been treated with *copious* bleeding, stimulating clysters of salt and water, and stimulating purgative drenches. A disorder very similar to the Swansea distemper has occurred among

cattle at times in some rich meadow farms in Somersetshire; about which I have been consulted. The proprietors have the same opinion with regard to its origin and nature as the Swansea people have, that is, they think it contagious, and imagine it originates in some poisonous herbs growing in the pastures, which flourish at some seasons and in some situations in a greater degree than at others.

The first occurrence of this disorder, or more probably the first time it attracted notice, was in the remarkably hot and dry summer of 1819, in the beginning of which a cow died on one of the farms, and was thrown into an adjoining river. The animal was washed a little way down the stream, and was left on the opposite side, which belonged to another farm. Here it became putrid and very offensive, and from this period the distemper began, and has been occurring at different periods ever since. The occupier of the farm, where the putrid carcase was washed, lost a considerable number of cattle; and, considering the putrid carcase as the cause, brought an action against the farmer who threw the dead cow into the river. A verdict, however, was found for the defendant; some eminent physicians and surgeons who were subpœnaed on the occasion, as well as Mr. Barrett, Veterinary Surgeon, and myself, being of

opinion that the loss did not originate from the putrid carcase. At present, however, I have some doubt upon this point; and at all events would advise every one to bury animals immediately, skin and all, when they die of highly inflammatory disorders, as these *certainly* were, especially in summer. Only one of the animals attacked with this distemper recovered, and he was bled profusely, that is, to faintness. It is worthy of remark, that in every animal that has died of this disorder, (for sheep, and pigs, and one horse, have died of it, besides a great number of cattle,) and they appear to have examined a great number, if not all that have died, the spleen or milt has been found greatly enlarged and distended, or even bursting with dark fluid blood. According to the account of those people, this was the only morbid appearance. This, however, I have reason to believe is an error, owing to their incompetency to examine or judge of the state of the internal parts: for since that time, I have been sent for to examine three cows that lay dead of the disorder. In all of them I found the spleen as they described; that is, enlarged to about four times its natural size, and nearly bursting with dark-coloured fluid blood: a great deal appeared to have oozed through its investing membrane into the abdomen, and to have tinged and even

penetrated into the texture of some of the neighbouring parts. But this was not the only morbid appearance; there was a considerable accumulation of blood in the brain, especially in two of them, and some of the small vessels had burst. One of them being rather fat was stuck a short time before the fatal symptoms came on; and in this the spleen and the brain were the organs chiefly affected; but in the others the heart and lungs were much affected, or rather distended with blood; and in one of these the heart and the liver were very tender, and easily broken with the finger. Whether this enlargement of the spleen is a singular or peculiar occurrence or not, is at present uncertain; for it is an organ to which so little importance has been attached in veterinary examinations, that I can easily conceive that a considerable enlargement of it may have escaped notice; or not being thought worthy of notice or recollection, may have been entirely forgotten. I cannot find a similar disease of the spleen described in any English or French veterinary book. It appears to me that one important use of the spleen is pointed out by these cases, especially when we consider how spongious and dilatable it is, and how little sensibility it possesses. It seems to serve as a receptacle for superfluous blood, when the

sanguiferous system is in a state of repletion, and there happens to be a retrocession of blood from the surface of the body in consequence of the chilling impressions of a cold foggy atmosphere; for I should have observed, that the stomachs of the cattle I examined were loaded with food, and that a river ran through the meadows in which they were kept; in which situation the night fogs are often very cold, and particularly apt to chill animals when the stomach is loaded with food, and the sanguiferous system with blood. An animal dying in this state, or 'in the blood,' as it is commonly termed, soon becomes putrid, and may be a source of contagion.

But to return to stomach staggers. The horses which I have seen in this complaint have generally been farmers' horses, that have been kept hard and worked hard, and in whom the stomach has been gradually weakened, and at length brought to that ultimate degree of weakness which is named palsy. In several that I examined, the vessels of the brain were not loaded in a remarkable degree, the stomach only was affected and evidently paralyzed. The disease is scarcely ever noticed in this class of horses, until it is absolutely incurable. Many of those horses were attacked at grass, and almost always in low wet situations, where the

grass was rank and abundant. It is not unlikely that in such situations the cold night air and fogs contribute something to the increase, if not to the production of the disorder. In the neighbourhood of Exeter the disease has at times been very common, especially in low, open, wet situations, as in the parish of Stoke, Exminster, and Dawlish. I have cured several cases, but in these the disorder was taken rather early, and the horses were in tolerable condition, and had been kept in a stable on good food. In none has a cure been effected without a considerable discharge from the bowels of excrement that appeared to have been pent up in them for some time.

In establishments where horses are worked fairly and properly fed, I have scarcely ever known this disorder happen. Not a single case occurred in the Royal Dragoons during the time I was veterinary surgeon to the regiment, nor in Mr. Russell's establishment in Exeter, whose horses I attended for many years. I am inclined to think the disease is not so prevalent as it was twenty years since; and this may be owing to an improvement in the method of keeping and feeding horses. Probably, too, the great progress that has been made in the cultivation and draining of low marshy land may

have contributed to the decrease of the disorder.

I am indebted to the late Mr. Poole, an intelligent farrier, who practised extensively at Pansborough, near Wells, in the Moors or Moor Country, as it is termed, for some valuable information on this subject, which seems to confirm the opinion I have before suggested, that there are different kinds of this disorder. That which occurred at Swansea I would call the acute kind: and it evidently depended on repletion of the blood vessels, as well as of the stomach and bowels, and might, I think, have been more successfully treated than it was, had the horses been bled copiously, clystered several times (having been previously raked) with salt and water, and drenched with warm stimulating purgatives. The chronic kind is that which Mr. Poole describes. He says, that before the moors in the district where he resided were enclosed and drained, staggers or lethargy frequently happened, and destroyed more horses than any other disorder; but that since they have been inclosed it scarcely ever happens. The following are the symptoms:—standing in one place three or four hours while others were feeding; gaping several times without intermission; resting the chin on a gate,

stile, or manger, or pushing the head against a tree or post; the urine and dung in small quantity, the latter often with slime, or mucus, on its surface; at length rambling about, catching here and there a mouthful of grass, till at last they terminate their life in a ditch, pond, or river. Bleeding in the usual quantity, he says, was sure to prove fatal. The disease was generally considered incurable; but he cured one horse with beer and ginger, and another with snake-root, mustard, saffron, compound spirit of lavender, and ginger. They attributed the disorder to the animal's eating the plant ragwort (senecio jacobæa,) or staggerwort. In the next parish moor, where this herb abounded, and where many cattle were kept, cows were seized with this disorder, and died in the same manner. He never heard of one being cured. The disease was much slower in its progress than any cases of staggers I have met with. In some instances it continued nearly two months. Mr. Poole did not examine the body of any animal that died of this disorder.

From the foregoing accounts, it is evident that there are different degrees of stomach staggers, both in horses and cattle, and that all of them are incurable, unless seasonably attended to. In the first, or acute degree, early and copious bleeding seems to be an essential remedy. Af-

terwards raking the animal, that is, drawing out the hard dung with the hand, and afterwards throwing up a clyster of salt and water every two or three hours; then giving the following drench or ball, and afterwards three or four drams of compound spirit of ammonia in a pint of warm water every two hours, and a quart of warm water, every hour, in order to soften the contents of the stomach and bowels. In the second stage, that is, in the cases I have generally met with, copious bleeding is not so essential as in the first stage: still, bleeding is generally necessary. As to the extent of the bleeding, we must be guided by circumstances. I have seen the most copious bleeding avail nothing; but then probably the vital power of the stomach was irrecoverably lost before the disease was observed. In the first kind, there is a repletion of the blood vessels as well as of the stomach, and the relief of the former is often the primary object; but in the second kind, which occurs generally among small farmers' horses, which are badly or indifferently fed, and worked hard, probably kept out in some cold wet situation, the horses are generally suffering from poverty of blood and a deficiency of vital power. Here without early assistance th stomach soon becomes paralysed, and the relief

of this important organ is generally the primary indication. In the third kind, or moor staggers, bleeding "was sure to prove fatal;" and the remedies employed for the two horses which Mr. Poole cured were powerful stimulants and cordials. In the second kind I have sometimes succeeded by giving warm stimulating purgatives, and clystering the horse frequently, until a discharge was obtained from the bowels. I have bled according to circumstances,—sometimes from the temporal arteries; but am inclined to believe that bleeding from the jugular veins is preferable, as it is the veins of the brain that are loaded in such cases, and these empty themselves into the jugular veins. A horse affected with stomach staggers requires constant attention. The contents of the stomach and bowels are generally in a dry state, therefore he should be frequently drenched with warm water, with two or three tea spoonfuls of compound spirit of ammonia mixed with it. I am inclined to think the carbonate of soda would greatly assist the warm water in softening the contents of the stomach, and thereby facilitate their discharge.

I have been informed by an intelligent correspondent that he always cures his cattle, when hoven or blasted, by giving them a solution of

four ounces of carbonate of soda in a pint of water, and half a pint of castor oil. It is not unlikely, I think, from this circumstance, that carbonate of soda, in much smaller doses, may be found a useful auxiliary in stomach staggers. The old compound tincture of aloes, named tinctura sacra, would be found, I think, a useful warm purgative, or from half an ounce to an ounce of aloes, dissolved in warm gin and water. When no medicines are at hand, mustard and salt may be given in some warm beer, and repeated as there may be occasion: and when there is no clyster pipe, the dung should be drawn out with the hand several times a day.

Gibson relates a case of staggers, where he found "the stomach and all the guts, both large and small, filled and crammed to such a degree, that it would have been impossible by any means whatever to have procured the least vent. For all the aliment in the stomach, and the dung in the intestines, from one end to the other, was entirely dry and without moisture; and before they were ripped open they appeared as hard and full crammed as a Bologna sausage, without any yielding or softness in any part. The contents of the guts were chiefly leaves, neither well chewed nor digested, with a mixture of grass. There was little or no grass in the stomach, but

chiefly acorn cups, oak leaves, and sloes, which was distended to its utmost extent." "I am apt to imagine," he says, "that this horse, who was upon a very rank after-mash, had been so surfeited that he came to loathe his grass, and, his appetite being depraved, had taken to those things which were acid and sour to the taste, which must have greatly aggravated his distemper by their restringent and binding quality. I rubbed the contents both of his stomach and intestines between my hands, which crumbled like dung dried in the sun, without the least drop of moisture or any ill savour, for there was no room for air to be pent up in them, wherein is the stench chiefly that is felt in opening the intestines of dead animals. And indeed it was somewhat extraordinary that he lived to come to this extremity, as the motion of the stomach and guts had probably been lost for several days."

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5. *Chronic Cough.*

This disorder, though of little comparative importance, and seldom hindering a horse from doing his work, is more frequently a subject of complaint than any other, and is often very difficult to cure. It is often brought on by improper

feeding, and especially by feeding on bad hay: sometimes it is a consequence of catching cold, and sometimes remains after a horse has been cured of quinsy, or sore throat. Horses that are taken up late from grass often contract a troublesome cough. I have known cases of chronic cough which may be truly called nervous, any sudden alarm, or any thing which suddenly raised the attention of the animal, bringing on a fit of coughing. I have lately been consulted in a case where the cough began generally on first opening the stable, which could not have been caused by the cold air coming in, because there was a double door, and the outer door was shut before the inner was opened. This horse had been kept out at grass late, and then the cold fogs at night are often injurious to horses of delicate skins, that have been accustomed to warm stables, clothing, and regular grooming. Coughs are often brought on in this way, and are properly enough called grass coughs: they are often obstinate, and sometimes incurable; but, under prudent management, do not degenerate into broken wind.

In the latter moulting season, that is, about the latter end of September or in October, horses are very liable to contract coughs which are often obstinate. I have seen coughs of a serious nature produced by curing obstinate cutaneous

diseases by local applications; in one case of this kind that came under my observation, abscesses formed in the lungs, and destroyed the animal. Tubercles in the lungs are sometimes a cause of cough, and such coughs generally terminate in consumption. In whatever manner cough is produced, it is always aggravated by improper feeding and exposure to cold and wet, especially in horses that are accustomed to clothing and regular grooming, and still more so in those accustomed to a warm stable. The coughs produced by inordinate feeding on hay, especially when the hay is bad, are attended generally with an increased secretion of mucus in the air passages, causing thickness of wind, and sometimes a little discharge from the nostrils, and a little wheezing or rattling in breathing. There is generally a craving for water also, and some degree of sluggishness in work. The wind, or breathing, is affected by going fast, especially up hill, and when the horse is first taken out, or for the first three or four miles of the journey. The nervous cough is loud, shrill, and strong; that arising from inordinate feeding, and consequent stuffing of the air passages, is looser, husky or short, and asthmatic, or approaching to that peculiar sound of the broken-winded cough. The nervous cough comes on in fits, generally on beginning to feed, or after drink-

ing, or on first starting; the cough seems very distressing, and it appears as if the horse made great efforts to cough up some irritating matter; but, after the first fit of coughing, he generally goes through his journey without coughing again. Chronic cough sometimes gets much better, or entirely goes off for two or three days, or longer, and then returns as bad as before, either from exposure to wet or to a current of air in the stable, and often without any apparent cause. A discharge from the nostrils sometimes comes on, and appears to relieve the cough. A great variety of remedies have, at different times, been proposed for chronic cough, and all of them will frequently be found to fail, especially when proper attention is not paid to the horse's diet, which should be rather of an opening kind, and easy of digestion. If he has been accustomed to eat immoderately of hay, his allowance must be limited to from eight to twelve pounds, and none but good sweet hay, free from dust, should be given. Mashes of sweet fresh bran are useful, especially if the horse is only exercised; but, if in regular work, he must have a suitable allowance of good oats, sifted ; and if he be craving for water, both hay and oats may be sprinkled with it. The stable should be kept clean and sweet, and free from dust. Coughs are

often relieved by diuretic medicines joined with cordials, also by the expectorant ball. (See Vol. II.) But both these are more likely to be efficacious if preceded by a dose of physic. Opium, joined with cordials and expectorants, will often remove chronic cough for a time; at others, drenches of oxymel of squills, or of garlic, or a simple oxymel of vinegar and treacle, either alone, or with a table-spoonful of laudanum, will afford relief. I have lately prescribed the following expectorant ball for chronic cough, in which there appeared to be a secretion of viscid mucus in the bronchiæ, or small branches of the windpipe, which was shown by clots of mucus being discharged by the nostrils; for, from the peculiar construction of the horse's throat, he can only expectorate through the nostrils. In the first place, however, I prescribed a mild dose of mercurial physic, as the secretion of viscid mucus in the lungs may have depended, in some measure, upon a foul state of the bowels.

Expectorant Ball.

Gum ammoniacum	2 oz.
Powdered squills	1 oz.
Powdered ipecacuana	½ oz.
Powdered opium	½ oz.
Powdered ginger	1 oz.
Powdered allspice	1 oz.

Oil of aniseed	½ oz.
Balsam of sulphur	4 oz.
Castile soap softened by being beat up with a little syrup	2 oz.

To be beat into a mass, and divided into middle-sized balls, of which one is to be given every morning and evening after the operation of the physic. I have known small doses, about 1 dram of aloes and assafœtida, given daily with good effect.

To enumerate all the remedies that have been recommended for chronic cough would occupy a great deal of room to little or no purpose; for, however highly many nostrums may be recommended, experience has clearly proved that proper attention to feeding, grooming, and exercise will do more than all of them, and that none of them will avail without such attention. If the cough cannot be cured, it can always be moderated and prevented from injuring the horse's wind; and, indeed, may be so controlled, by good management in feeding, &c. as not to interfere materially with the horse's work. In some horses of delicate constitutions, where the cough seems to depend on a morbid sensibility of the larynx, it is necessary to guard against catching cold,—not by keeping the horse in a hot stable, or immoderately clothed, but by not exposing him unnecessarily to cold moist air,

or a current of air, when he is warm or heated by exercise. It is not unlikely that very cold water, or hard water, may have some tendency to aggravate the cough; at all events, it may as well be avoided; and, when no other water can be conveniently procured, the expedient I have before suggested may be resorted to; viz. rubbing up, or mixing well, a small knob of clay with each pail of water. Cold dry air appears to brace up the constitutions of horses; and we may often observe a great improvement in horses about Christmas, or when the cold frosty weather sets in. It is cold moist air, or rain, that does most harm; and horses, as well as cattle, that are kept out in low open marshy situations during winter, often suffer irreparable injury in their constitutions; and even in autumn, the cold fogs, in such situations, do much harm. The only means of counteracting the hurtful effects of keeping animals in such situations is to support their strength by liberal feeding.

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6. *Roaring*.

This is a disease of the organs of respiration, which generally proves incurable, and is considered by dealers as an unsoundness, in whatever degree it may exist. It occurs in different

degrees, and the obstruction in the air passages on which it depends is, I have reason to believe, differently seated. It is known by the noise which a horse makes in his breathing when going fast. Sometimes it is a noise approaching to that of whistling; at others, it is rather a wheezing kind of noise; or it is attended with a little rattling; and sometimes it sounds as if there was some obstruction in the higher part of the nostrils. Dealers, in examining a horse suspected of being a roarer, hold him short by the bridle and give him suddenly a smart blow with a whip, or a punch with the but end of a whip, under the short ribs, at the same time turning him short round; this, if he is a roarer, causes him to grunt, by a sudden expulsion of the breath through the obstructed part; but the most certain method of detecting it is either to ride the horse, or to let him pass you at a brisk canter, with another person on his back. Roaring has been attributed by some writers to an obstruction in the upper part of the trachea, near the larynx, in consequence of inflammation, and an effusion of coagulated lymph on that part. One case of this kind was examined, I believe, at the Veterinary College and, I rather think, the diseased part is now preserved in the Museum; but, in some other roarers that have been examined after death,

this obstruction in the windpipe has not been observed. In two cases I have found an ulcer in the chink of the glottis without any other morbid appearance. In one of these cases the horse was perfectly easy, and breathed freely when at rest in the stable; but when at work he was exceedingly distressed, and made such a noise in breathing, that he could be heard twenty yards off. This horse was killed for the purpose of examination, when the ulcer, on one side only of the chink of the larynx, was discovered. This horse had been a roarer for some time: he belonged to Mr. Russel's glandered team, and though slightly glandered was in good condition, and in good health except the roaring. Another case of roaring occurred in my own stable, and came on suddenly without any apparent cause. I can only account for it by supposing that an oat, or some part of the horse's food, got into the larynx. He was found in the morning with a violent cough and wheezing. He soon got better, however, and was sent home; but not long after the wheezing came on again, and the breathing in a short time became so loud that he could be heard at a considerable distance. He appeared so distressed that he was killed, and, upon examining him, the only morbid appearance I could find was an ulcer in

the chink of the larynx, exactly like that of the former case.

Another case of roaring came on after a severe attack of sore throat, in which there was an apparent enlargement of the larynx, which led to a suspicion of its being partially ossified; but this I was informed did not appear to be the case after death, nor was any disease found in the windpipe and lungs. Now, as an ulcer in the larynx was not at that time suspected either by myself (for I was called in in consultation about the horse) or the person who examined him, I think it likely that there was one, though none was observed. Another case I was consulted about succeeded to an inflammation and swelling of the throat. I have lately seen a case which succeeded to a chronic cough of long standing, and at this time the horse is completely broken-winded, but still able to work. This last case of roaring was rather of the rattling kind, and did not appear to interfere with the horse's work. About a month since I examined another roaring horse, in which there appeared to be a swelling about the throat; and at the same time the sound of his cough and his breathing led me to think that he will become broken-winded. This horse had been kept in a hot stable, and though

greedy in his appetite, had not been restrained either in hay or water. Here we may trace the disease, which was complicated with imperfect wind, to two causes, viz. a hot stable and improper feeding: I believe the case preceding this originated in the same causes. It is a remarkable circumstance in the horse, that, though the larynx (especially at that narrow part which is named the rima or chink) is so exquisitely sensible, the membrane lining the windpipe appears to be quite void of sensibility. I have several times made an opening in the front of the windpipe of a living horse, through which I have introduced my fore-finger, and scratched the inside of the windpipe with my nail, and the animal did not express any pain, or appear even to feel it. I have then passed up a bit of straw, so as to touch the larynx, and the most violent irritation was produced, and violent coughing. I had lately occasion to perform the operation of bronchotomy for the purpose of removing something which appeared to have got into a horse's larynx, when I desired a surgeon who was present to convince himself of the insensibility of the membrane lining the windpipe, by putting his finger through the opening I had made, and scratching it, which he did, and was perfectly satisfied. If we examine the lungs, with the windpipe, the larynx, and all the parts

through which the air passes in breathing, we shall find that the chink of the larynx is the part most likely to afford an impediment to the passage of air, by an increased secretion of mucus, by a thickening of its membrane, or by an approximation of its sides in consequence of nervous irritation. This nervous irritation may happen from the direct application of stimulating vapours to the larynx, as in breathing smoke from wood, or bleaching gas, or the dust of any thing that is acrid or stimulating, such as ipecacuana, jalap, ginger, &c. It may happen also from the irritation of other parts which are supplied by the same nerves. The stomach, for example, is supplied with nervous power by the eighth pair of nerves, named par vagum; and it is a branch of this nerve, named the recurrent nerve, which gives sensibility to the larynx. It is from this nervous communication that improper feeding may affect the larynx, especially when it is in a state of morbid sensibility. Horses that have been *mindered*, as it is termed, that is, poisoned by feeding near the lead mines, near Wells, are strongly affected with wheezing or a kind of roaring. I have seen the most distressing wheezing or roaring produced by bleeding too low down in the neck, and wounding or dividing the recurrent nerve: the horse died about twelve hours after the acci-

dent. I was prevented from ascertaining this by dissection, a farrier having mangled the neck of the horse before I came for the purpose of examining the wound. But from the experiments that have been made by M. Gallois I have no doubt that the recurrent nerve, or the par vagum itself, was either wounded or divided. This gentleman has published an account of a series of experiments made on rabbits before the Royal French Academy, to prove that by dividing the recurrent nerve the chink of the larynx is immediately closed either partially or wholly, and suffocation, or great difficulty of breathing, is the immediate consequence. The same nerve which gives sensibility to the larynx passes down the membrane which lines the windpipe, to the lungs. Now the insensibility of the windpipe may depend on the branches of the nerve which pass down being defended by the thickness of the membrane; but after the windpipe has divided into innumerable branches in the substance of the lungs, the membrane becomes gradually thinner, and more sensible; so that when the mucous secretion in the lungs becomes acrimonious, we may readily conceive that the irritation it occasions may be propagated to the larynx, and cause coughing or roaring, though the inside of the windpipe is insensible.

I have been for many years affected with an asthmatic complaint, and can feel that when there is an accumulation of viscid and irritating mucus in the lungs it occasions irritation in the larynx, exciting a troublesome cough until the cause is removed; and sometimes the irritation is such as to cause wheezing. At times eating or drinking improperly will immediately bring on wheezing, especially loading the stomach with food. Cold moist air will also bring it on, or a draught of effervescing soda water would cause some degree of wheezing for a short time, or even the first morsel of any food that had an unpleasant taste or smell. I have often felt the rima of the glottis nearly closed by the first morsel of any thing that had a disagreeable smell; but it went off almost immediately, and I have been able to swallow another morsel without feeling this effect. From all the above circumstances it appears to me that roaring may depend on a diseased state of the membrane of the larynx alone, or of the mucous membrane of the lungs, or of both; that it is sometimes a consequence of severe cold, of sore throat, or of strangles, or may be brought on by a continuance of improper feeding, or by a complication of these causes: that it may take place rather suddenly, or immediately after a severe attack of sore throat; or

that it may gradually succeed chronic cough, or be brought on gradually by keeping a horse in a hot close stable, by which he would be frequently catching cold, or whenever he was exposed to a cold moist air. When the membrane of the larynx is the seat of the disease, I am inclined to believe that it sometimes becomes permanently thickened; and it is evident from dissection that it is sometimes ulcerated. In the case where an effusion of coagulable lymph had taken place in the windpipe, there must have been a high degree of inflammation in the membrane which lines the windpipe, as well as in the cellular membrane which lies between it and the cartilages of the windpipe. I rather think Mr. Richard Lawrence has noticed a case of this kind which terminated in suffocation, though the operation of bronchotomy had been performed; that is, an opening had been made in the windpipe below the affected part, to supply the lungs with air. This was supposed, I believe, either to have been brought on, or greatly aggravated, by the very common method of examining a horse's wind, by grasping and compressing the top of the windpipe, immediately under the larynx, until the animal coughs. When a horse is offered for sale it is astonishing how many trials of this kind he is obliged some-

times to undergo, and with what force and violence it is sometimes practised.

In this disease, as in most others, prevention is much easier than cure, and consists in keeping a horse in a stable that is properly ventilated, and feeding him properly; and if he happens to be heated by exercise, not to let him stand still in the cold, and especially in cold and wet. The cure of this disease, when it is curable, and that can be only at its commencement, can only be accomplished by bleeding, by blistering the throat extensively, by a light opening diet, mild physic, and afterwards some gentle expectorant or diuretic medicine, according to circumstances. When it is incurable, which is generally the case, relief may sometimes be afforded by careful feeding, avoiding exposure to wet or cold moist air, and by riding the animal moderately. Dust and irritating vapours should also be carefully avoided.

From the experiments of M. Gallois it seems likely that if the recurrent nerve happens to be wounded, the animal may be relieved by making an opening in the windpipe, and keeping it open until the nerve is reunited. This operation, named bronchotomy, is by no means so formidable as it is commonly supposed to be; there is no occasion for keeping a tube in the opening; and if

the divided skin is afterwards brought together by a stitch or two, it does not prevent the air from passing in and out through the opening; and when the obstruction in the larynx has been removed, by passing up a small probang, and the inflammation which it occasioned has subsided, the wound in the windpipe will gradually, but slowly, heal.

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7. *Broken Wind, or Asthma.*

Some variety may be observed in the symptoms or degree of this disease, as in chronic cough and roaring, and by good management a broken-winded horse may generally be made very useful. I have several times so far succeeded as to cure the disease for a time; and in one case, a horse of my own, the disease was so completely removed that I kept the animal in constant work for more than a year afterwards.

This horse was as badly broken-winded as a horse could be. He was kept on bran and oats and a moderate quantity of good hay. In the spring he had some vetches and grass in the stable, which was cool, and well ventilated. He was ridden at first very moderately, but after two or three months he was ridden at a full trot, and sometimes galloped without inconvenience.

I have seen another case of complete broken wind apparently cured by turning the animal, in dry summer weather, into a field, where there was no water. This mare had been purchased as a subject for some experiments relative to glanders, being so bad as to be thought fit for nothing else. After the experiments were finished I thought it right to kill her, when I found the lungs, and all the parts connected with them, perfectly sound, and at the time she was killed not a symptom of broken wind could be discovered. I have seen other broken-winded horses treated in a similar manner, and with the same result; and I have seen broken-winded horses apparently cured by being kept at grass a short time, but get as bad as ever a little time after they had been taken back into the stable. I have known diuretic medicines afford great relief in broken wind, especially when mixed with cordials; but above all things it is necessary to avoid loading the stomach either with hay or water, and to give such food only as is easy of digestion, and sufficiently nutritious to support the animal's strength. As the work of a broken-winded horse should never exceed that degree of exertion which his general strength and wind will admit of without inconvenience, a mixture of bran and oats is perhaps the best diet; and when vetches or other green

food can be obtained, a moderate quantity, or rather a small qnantity, at a time, of such food may be given. During the summer the open air is the best situation, but if the horse is craving for water he should be put into a field where there is none, and one where the grass is short should be chosen. In wet weather or in situations where there are cold fogs at night, the horse should be put into a cool, airy stable or box, where he may be loose, and without litter or hay, as he might be induced to eat too much of either. A feed of oats and bran may be given. There is generally in broken-winded horses considerable weakness of the stomach and bowels, and this, with the imperfection in breathing, causes general debility. In this weakened state of the digestive organs, which is generally accompanied with an inordinate appetite both for food and water, the blood becomes poor and loaded with excrementitious matter, unless the animal is fed in the most careful manner, and then balls composed of diuretic and cordial medicines will strengthen the stomach and bowels in some degree, and at the same time, by increasing the secretion of urine, carry off through those emunctories what might otherwise have fallen upon the mucous membrane of the lungs, or air passages. Hot close stables are exceedingly injurious to

broken-winded horses, and cold moist air is still more so. The most common cause of broken wind is immoderate and foul feeding, which is always attended with a proportionate desire for water; and when a horse is not restrained in feeding he seldom is in drinking. The consequence of this imprudent management is an increased and morbid secretion in the mucous membrane of the lungs, or air vessels and passages; that is, the bronchiæ, or innumerable branches of the windpipe, also the windpipe, larynx, and nostrils. The small branches of the windpipe are at length loaded with viscid mucus, or what is commonly called *tough phlegm,* which causes violent fits of coughing, especially when the animal is put into quick motion, or made to exert himself in drawing. As the stomach and bowels of such horses are always much enlarged, and generally loaded with food and excrement, the motion of the diaphragm or midriff is impeded. These impediments to breathing, and the violence and frequency of the cough, rupture some of the air vessels of the lungs; so that the air, instead of being confined within its proper vessels, viz. the branches of the windpipe, gets into the cellular, or common connecting membrane of the lungs, and at length forces its way to the investing membrane of the lungs, named pleura,

which being impervious to air, confines it, but is in different parts raised up into bladders. This has often been observed in broken-winded horses. Mr. Leigh, veterinary surgeon, of Bristol, lately informed me that he had just opened a broken-winded horse, in which the greater part of the pleura was thus inflated and raised up into bladders. It is this extravasation of air into the cellular membrane of the lungs which causes their enlargement, a circumstance noticed by Gibson; but the rupture of the air vessels was first discovered by Professor Coleman. This emphysematous state of the lungs is the cause of the peculiar manner in which a broken-winded horse breathes. He makes a great effort, as may be seen by the abdominal muscles, and the drawing up of his flanks, to squeeze out the air from his lungs, and in doing this he probably compresses and condenses some of the air that cannot be pressed out: this, aided by the natural elasticity of the lungs, causes a sudden expansion, which is seen by the sudden fall of the abdominal muscles; after this the inspiration is continued slowly until it is completed. The French veterinary surgeons consider this kind of breathing as the distinguishing sympton of broken wind. "Il n'est pas necessaire pour juger un cheval poussif qu'il tousse, ni qu'il jête, le symptom du *battement*

en deux temps suffit seul pour le caracteriser têl; et l'on voit souvent des chevaux poussifs outrés, ne point tousser ni jeter." *La Fosse Manuel d'Hippiatrique.*

It is not improbable that the lungs sometimes becomes emphysematous and œdematous, or dropsical, at the same time; but such cases are not, I believe, common; and in some instances disordered breathing may depend on a dropsical state of the lungs, accompanied with a morbid secretion in the air vessels. From the preceding observations on disordered respiration it will appear that chronic cough, roaring, and broken wind, or asthma, are complaints of the same family, generally originating in improper feeding, and hot, close stables; and that their progress is sometimes accelerated by immoderate work. Hot close stables may in themselves prove injurious to the lungs, but they are chiefly so by rendering a horse more susceptible than he would otherwise be of the impressions of cold moist air. Improper feeding may perhaps be considered as the most common origin of chronic cough and broken wind, but roaring is often a consequence of a severe catarrh or sore throat. The water given to a broken-winded horse should not only be in moderate quantity, but when hard softened with a little clay, and brought to the summer temperature by the ad-

dition of a little warm water, or by standing a sufficient time in the stable.

The constitutional debility attendant on broken wind is generally proportional to the length of time the disease has been standing; and the greater the debility the less chance is there of affording relief.

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8. *Vertigo, Megrims, Epilepsy, amd Hydrocephalus.*

Though these diseases of the brain may sometimes depend on good living and idleness, and in some instances, I believe, on the irritation of botts in the stomach; yet, more frequently, I believe, they are gradually brought on by loading the stomach and bowels with hay, and especially bad hay. The irritation of the worms thus engendered may be one auxiliary cause, and the poverty of the blood of horses that have been so kept for a considerable time may be another. When a horse has been worked hard and fed high, and especially horses that excel in trotting, we often find, in the course of a few years, that they appear giddy at times, or when trotting suddenly stand still; ramble or reel a little, and shake their heads; but after a short time recover. Sometimes they reel and drop down and

lie motionless for some time; when they get up again, and recover in a short time. Sometimes after falling down, they are convulsed, and the eyes are distorted; from this state also they recover after a short time. Gibson gives a good description of a complaint of this kind: he says, "the previous symptoms are drowsiness, watery, moist eyes, somewhat full and inflamed; a disposition to reel; feebleness; a bad appetite, and almost a continual hanging of the head, or resting it in his manger. Sometimes with little or no fever, and scarce any alteration in his dung or urine. When the disease proceeds from water in the ventricles of the brain, the horse has generally, besides the foregoing, a disposition to rear up, and is apt to fall back when any one goes to handle him about the head." Young horses, he says, are most subject to it. I have met with it in a colt, and in old horses, and it occurs, as I have before stated, in various degrees. The remedies are bleeding in both jugular veins, at the same time, until the horse is relieved. I have succeeded by opening the temporal arteries, after bleeding in the jugular vein had failed of affording relief. The late Mr. Poole, a respectable farrier, of whom I have before spoken, informed me that he cured several cases of this kind by bleeding freely in the tail, and giving afterwards half

an ounce of red lavender in water. After the horse has recovered from the fit, he should be purged and fed sparingly for some time. A run at grass is the best thing for him, if the season of the year will admit, or soiling in the stable. I have, within the last year, cured a horse of two attacks of this kind; first by copious bleeding from the jugular vein, clysters, and opening medicine. The second attack came on about a month after the first, and was relieved by the same means, with the addition of a blister on the forehead, and a rowel under the jaw. To prevent a recurrence of the attack, I directed a very spare diet; that is, about four pounds of hay, and two of bran mashes. A muzzle was applied to prevent him from eating his litter. He was kept loose in a box, where he got perfectly well; and, as soon as the weather became settled, was turned to grass, and remained out about two months, and has been perfectly well ever since.*

* In a Treatise on Veterinary Medicine, by J. B. Volpi, one of the Professors of the Veterinary School at Milan, I find the Stomach Staggers described under the name *fièvre pernicieuse.* "No veterinary writer," says the author, "has noticed this disease in animals. This disorder announces itself by an appearance of stupor, and a general depression of strength. The horse refuses all kinds of food, and appears to have no strength in his jaws; for if he takes some hay into his

I have now given a more connected view of the diseases resulting from improper feeding, and a consequent morbid condition of the di-

mouth, he keeps it only a short time, and then lets it drop out again. He has great aversion, or rather dread of drinking, though the power of swallowing does not appear to be impaired: he is gaping or yawning almost continually; his lips are often covered with foam or froth; he hangs down his head, or rests it in the manger; his eyes appear dim, and he does not seem to notice the objects around him; his walk is staggering, and he appears every now and then as if he were about to fall; there is often some degree of delirium, and convulsive twitching in the tendons (quere, muscles) of the chest?: the pulse is small, soft, sometimes irregular, and always slow; cold sweats break out; the dung is scanty, in small hard knobs; the urine clear. On the approach of death, the jaws become locked, and there is generally a discharge from the nostrils. The cause of this disease is unknown: it generally kills the animal in two or three days. It is often considered as a case of indigestion. On examining the body after death, no morbid appearance worthy of notice has been observed." Experience having shown that the disease is always fatal when treated as an inflammatory disorder, it is evident that an opposite mode of treatment should be adopted, such as giving opium in a dose of from one to two or three drams daily; secondly, by giving from six to eighteen ounces of brandy, and two or three bottles of generous wine. These are the means by which we generally triumph over this disorder. M. Barthelemy, one of the Professors of the Veterinary School at Alfort, near Paris, has published a short account of this Italian work, with a kind of abridgment, or analysis of it, in one Pamphlet. In remarking on this disease, *fièvre pernicieuse*, he says, "the description which M. Volpi

gestive organs, than in former editions of this volume. The time that has elapsed since the last edition was published is not considerable, but it has afforded me opportunities of seeing numerous cases confirmative of the opinion I have before given relative to the importance of attending to the digestive organs more than is generally done. If I have enlarged a little upon the different subjects in the present edition, it is from a desire to impress upon the reader's mind their importance, and to lead him as far as I can to reflect upon them. And, to avoid enlarging the volume unnecessarily, I have omitted some diseases, because they are

has given of this disease, joined with the observations which follow it, appears to me to prove that it is nothing more than the disease commonly known in France by the name Abdominal Vertigo, or Symptomatic Vertigo, a disorder that is very seldom cured, and in the treatment of which M. Volpi assures us he has been successful; so much so, that, in 1811, many preachers (predicateurs) in the environs of Milan, had announced from their pulpits (en chaise) that M. Volpi had discovered a method of curing the disease which had made such ravages among horses. The new point of view in which M. Volpi has placed this disorder appears to us to merit particular attention; the more so, as the name Abdominal Vertigo had been applied indiscriminately to disorders altogether different in their natures; and as very lately the remedies he has recommended for what he calls *fièvre pernicieuse* have been employed by us with complete success in a very severe case of what we call Abdominal Vertigo."

so fully treated of in the last edition (thirteenth) of the first volume, or compendium. I have also endeavoured to confine myself to what is really practical and useful; for, however specious and amusing theories may be, yet they are apt to lead the young practitioner out of the more useful path of careful and patient observation,—the only foundation upon which real improvement can be built. I cannot, however, conclude without once more repeating that, in all those diseases arising from a morbid condition or distension of the stomach and bowels, though the cure is sometimes difficult, and often impossible, prevention is easy and not expensive. It requires only more care in the choice and distribution of food, and more moderation and humanity in working the animal. By attending to this, the horse proprietor will be amply repaid, not only as it regards the saving he will experience in the continuance of the life and health, and consequently of the labour of the horse; but also as it regards his own feelings as a Christian. The muscular debility arising from a distended stomach and bowels is considerable; but what is it when compared to what is produced by the immoderate and cruel exertions in which these poor animals are often employed, especially in stage coaches, where their work is daily and unremitting? In the

hottest day in summer, they are compelled to do the same work, and to travel at the same rate, as in the coldest day of winter; and, such is the generous and emulative spirit of the horse, that he will endeavour to perform the painful task though he drop down and die in the attempt. Considerations of this kind lead me almost insensibly into another subject; that is, lameness, which often arises from the immoderate and cruel manner in which this useful animal is worked, especially by bringing him into work, and often hard work, so early as is generally done. It is by this imprudence joined to that I have already pointed out, that so many horses are ruined in their feet, limbs, and constitution, before they arrive at a mature age.

CHAPTER X.

MAD STAGGERS.—PHRENITIS.

In mad staggers there is generally a high delirium, instead of that sleepy comatose appearance by which the sleepy staggers is distinguished. The animal is often so violent that it is dangerous to approach him, and it is with difficulty that the only remedy can be applied, that is, bleeding until the delirium ceases, or the animal falls down. The difficulty of performing the operation, and drawing off a sufficient quantity of blood, renders it necessary, as soon as the two neck veins have been opened, to tie a cord round the neck, in order to keep up the bleeding without standing near the animal. It is unnecessary to save the blood, or to measure the quantity, as that can only be determined by the cessation of the symptoms. It has been found necessary to take more than four gallons on such an occasion at one time. If the disease does not submit to this remedy, it may be deemed incurable. Blistering the head has been recommended, and cathartic medicines. After recovery, he should be fed sparingly for some time; but it is better to turn him to grass, where he should remain for

one month at least, and when taken up, fed rather sparingly and in proportion only to his work. Should this disorder return, the same remedy must be resorted to. The disease sometimes causes an effusion of water in the ventricles of the brain, and that is incurable. In this case there is sometimes a remission of the delirium, but it is seldom considerable. Sometimes the delirium changes into sleepiness or insensibility, which denotes the rupture of a blood-vessel, generally at the basis of the brain, or the beginning of the spinal marrow; this also is incurable.

Mad staggers is caused by keeping horses idle in the stable and feeding them freely with corn, whereby a greater quantity of blood is generated than is necessary for the repairs of the body; for, as the muscles are unemployed, there is soon an undue accumulation of blood, and the vital organs are sure to suffer in consequence, especially the brain, the lungs, and the bowels. This disorder most commonly occurs among carriage horses, whose work is little more than moderate exercise, often scarcely amounting to that, while at the same time they are allowed an unlimited quantity of corn in order to keep up what is considered a handsome appearance. Disorders of the brain occur also among post and stage-coach horses; but they are different

from that I have just described. They also require bleeding, and to a considerable extent; but the stomach is the primary seat of the disorder, and it depends upon an exhausted state of this organ, or rather upon an exhaustion of the vital powers of the brain. The nature of their work is such that they require an unlimited allowance of the most nutritious food; and were they fed almost wholly upon oats, given frequently in moderate or small quantities, and moistened with water, they would do their work better, and be much freer from disease than they now are. I have known many horses of this description killed by being worked upon a full stomach.

CHAPTER XI.

INFLAMMATION OF THE BOWELS.

INFLAMMATION of the bowels may be produced in the same manner as mad staggers or pleurisy, that is, simply by repletion of the blood-vessels; but it generally proceeds from other causes, and the most common is indigestion; for the flatulent colic, when neglected or improperly treated, or when occurring in such a degree that the small intestines or a portion of them are affected, ruptures the mesentery and becomes entangled in it; and then inflammation takes place and always proves fatal. The symptoms which precede inflammation of the bowels, when caused simply by repletion of the blood-vessels, are similar to those which precede pleurisy; that is, dulness, heaviness of the head, diminution of appetite, and especially redness of the inner surface of the eye-lids. The disease, therefore, comes on gradually, and is sometimes accompanied with quickness of breathing, quick pulse, and other symptoms of pleurisy; as the disorder advances, it assumes the appearance of flatulent colic, and even of mad staggers. This disease is less frequent by far than that which fol-

lows flatulent colic; but it does sometimes occur, especially in horses that are changed suddenly from grass to warm stables, and then requires to be treated as I have directed in pleurisy. It is scarcely necessary to observe, that inflammation of the bowels, when caused by repletion of the blood-vessels, can be cured only by plentiful bleeding, as I have described in pleurisy. Attention, however, is necessary to the state of the bowels, for the disorder is sometimes relieved in a certain degree by an effort of nature. It then assumes the appearance of *molten grease*, which is in fact the same thing; that is, an effort of nature to relieve inflammation of the bowels. In this case there will sometimes be a purging, which should rather be encouraged than checked; and if small slimy knobs of dung are voided, especially if they are covered with a substance resembling fat, a pint of castor oil should be given, or the oily laxative prescribed in the second volume. If castor oil cannot be afforded, olive oil will be found the best substitute. Clysters also are useful. The neutral salts named sulphate of soda and sulphate of magnesia may be given with castor or blue oil.

CHAPTER XII.

ON LAMENESS.

In the first edition of this volume, I gave the substance of some lectures I delivered at Exeter, on the structure, economy, and diseases of the horse's limbs, with a view to the prevention and cure of lameness. This attempt has been so favourably received, as to pass through five editions in a very few years. I am now, once more, entering upon a consideration of this important subject, which I can assure the reader has received my most serious attention, and will continue to do so as long as I am able to attend usefully to the veterinary profession. That prevention is easier, and far better than cure, is an old but valuable proverb, and in no case whatever is it more applicable than to the subject of the present chapter. I have, therefore, chosen it as a motto to the volume, and shall do so with every other volume I may in future publish. Lameness is produced by a variety of causes, so numerous, and often so obscure, that to discover the seat of lameness with accuracy and promptitude, is a mark of professional acumen, to which every young prac-

titioner should aspire. Let him not, however, be led by this consideration to give a hasty opinion in cases of lameness; but, on the contrary, let him investigate carefully, and reflect deliberately upon all the circumstances of the case, and be well assured that he knows the seat and nature of the lameness before he gives an opinion. Lameness may exist in a great variety of degrees; the shades, for so they may be named, between soundness and positive lameness, are so numerous, that to give a name to each would be impossible, and if possible, unprofitable. It will be sufficient to describe lameness under the names commonly employed, and such as I have adopted in former editions of this work. Some additions and alterations will be met with, and those I trust of a very important nature. From the preceding part of the volume, the reader may form some judgment of the nature and extent of those alterations and additions. The serious loss and inconvenience arising from lameness have excited particular attention to the subject; and, though considerable improvement has been made within a few years in the art of shoeing, as well as in the treatment of lameness, it is a generally acknowledged fact, I believe, that a large proportion of the lamenesses that occur will only admit of palliation, and that a considerable

number are absolutely incurable, especially those in the feet.

In alluding to the improvements in shoeing, I do not mean to include that which has been introduced from France, except as it regards the nailing of those shoes; for as to the French shoe, and its boasted *ajusture,* I think it the most absurd imaginable. That lameness is much more frequent in this country than in France, is a fact that must be admitted, and ought to be deeply lamented, because it is an evil that may and ought to be prevented. On what, then, it may be asked, does this particular frequency of lameness in this country depend? The French say on shoeing; but it is not really so: on the contrary, I am of opinion that the English shoeing, speaking generally, is the best in the world. The frequency of lameness, so loudly and justly complained of, arises wholly from the immoderate and cruel manner in which the animal is worked, and the early age at which he is brought into work. Though the prevention of lameness is considered as an object of the highest importance, a plain description will also be given of those diseases by which it is caused, and the mode of treatment will be minutely detailed. It is not, nor has it ever been, my intention to address professional men only; my book is intended for general use;

therefore, in this part, especially, all technical language will be, as far as it is consistent with the subject, avoided, and the diseases will be explained as plainly and clearly as I am able.

On Muscular Lameness.

Lameness may depend on different diseased states of the muscles, and these must be considered under distinct heads. Muscular lameness may arise from over-exertion, whereby an acute degree of inflammation is sometimes brought on, and a consequent exhaustion of the sensorial power. Different degrees of the same affection may be produced, the lowest of which is that of excessive fatigue, which is expressed by the animal while at rest, in lying stretched-out on his side, the head reposing at the same time, and generally, if not always, at the full length of his halter. When the fatigue is considerable, he often groans, and stretches himself out suddenly, and from the same cause we often see horses, when standing, after getting up from this situation, first stretching out one hind leg, then the other, then drawing up the body, and yawning; all these appearances are indicative of great fatigue, and should always be attended to. Horses, when only moderately tired, never

lie down in this manner, but repose as a cow does when ruminating. Old horses are sometimes so stiff, and so debilitated in their joints and muscular system, that they are unable to lie down; and if they do happen to succeed in an attempt to lie down, they are incapable of getting up again without assistance; and when this is not at hand, they often injure themselves materially, or exhaust their strength by struggling.

Lying down on the side, at full length, is by no means an easy position for the horse; he cannot lie so long without feeling great pain. For such is the weight of his body, as well as the distribution of the muscles, that the only easy position in reposing, is that of the ruminating cow. Horses that have become thus stiff, and weak in their muscles, would be greatly relieved by a support of the breeching kind; and this, I must observe, is a good method for supporting a lame horse, and may often be employed instead of that which is named slinging, and may be contrived with very little trouble. The next degree of muscular affection to this is commonly named a chill: which does not wholly depend, as is commonly supposed, on suppressed perspiration, but on a certain degree of exhaustion of the sensorial power of the muscles. The manner in which this sometimes appears to be produced, is the cause of its having been thus

named: for it often happens, when a horse has been violently exercised, that he is suffered to stand in a current of air to cool, or left there through negligence or drunkenness, and sometimes until he is scarcely able to move. But a more common method and unfortunately one too often authorized by the inn-keeper or coach-master, for theirs are the horses most commonly so treated, is that of plunging them into the pond; and, not satisfied with a short immersion, they are generally kept there for the purpose of washing the carriage also. The apology for this practice is that the horses are thereby refreshed, but the inducement really is, I believe, that it saves trouble. The injury this does, is not always immediate, nor is it always perceptible; but one thing post-masters may rest assured of, it always occasions some degree of muscular debility. It must not be supposed, however, that immersion in cold water will alone do this mischief; on the contrary, in summer, when they have no work, but are merely exercised, they are greatly refreshed and benefited by it; the mischief arises in consequence of previous exhaustion by excessive exertion, and so great may be the mischief, that the horse may drop down dead from a complete exhaustion of muscular power. This is a fact known to experienced sportsmen, and ought to be

guarded against by those of less experience. A CHILL then, or the second degree of morbid affection of the muscular system, depends on an exhaustion, in a greater or less degree, and more or less general, of the sensorial power of the muscular system. The symptoms thus produced are great stiffness of the body, so that the horse is nearly incapable of moving himself; sometimes the hind parts are more affected than the fore parts, and often both are so affected, that the horse is absolutely incapable of moving, so that he drops down and dies exhausted. Sometimes there is what is called a re-action of the system: that is, by what is generally considered a violent effort of nature, the blood is thrown towards the surface and the extremities, and a violent perspiration and inflammation of the feet are the consequence. This effect is generally as bad as the original disorder, that is, as it regards the horse, whose feet are of such essential importance, that unless they can be restored again, he is thereby rendered useless. It is of importance, therefore, to employ the remedy which will soon be pointed out, and to its full extent, and thereby prevent that destructive effect which has been improperly called an effort of nature. The effect thus produced on the feet is sometimes so great, that the hoofs are thrown off by the violence of the in-

flammation, and in a few instances, I have known even the feet themselves slough off or separate as high up as the fetlock joint.

The third degree of muscular affection generally destroys the horse in the course of a few hours. Such cases happen only, I believe, during a severe chace, and can only be relieved by bleeding to the extent of *two gallons at least.* If the horse faints from the bleeding, it may be considered a favourable circumstance: and if he does not faint, perhaps it will be advisable to take a larger quantity of blood. The same remedy is applicable to the second degree of muscular exhaustion, and equally necessary. But as to the first degree, or excessive fatigue, rest is the only remedy required. Cordials of all kinds are unnecessary or improper. Purgatives are extremely dangerous, but clysters are always useful, when properly administered, or so as to empty the large intestines. (See vol. ii. article *Clysters.*) No other medical treatment is required, except when the muscles of the loins and urinary organs are affected, and then a fresh sheep-skin should be placed on the back and loins, with the flesh side next the skin; this will soon excite a copious perspiration on the part, and thereby afford some relief. But the warm clothing commonly employed and warm stables, are extremely prejudicial. Such horses

cannot be kept too cool. The sheep-skin does good by the peculiar effect it has in exciting a speedy and copious perspiration, and should always be renewed when it acquires an offensive smell. This remedy, I must observe, is one of great importance, especially in locked jaw. Its use in this complaint was first pointed out in a treatise written on the subject by Mr. Wilkinson, Veterinary Surgeon, of Newcastle.

The urinary organs are very commonly affected in over-exertion of the muscular system. This appears sometimes in a frequent desire to make water, attended with much pain and difficulty. The attempt to stale becomes almost incessant, and a few drops only are voided of a high colour, approaching to that of blood. The pain becomes dreadful, so much so, that the horse appears griped, and if not prevented by the stiffness of his muscles and the lameness, he lies down, groans, and endeavours to roll, he then gets up again, and renews his painful but ineffectual efforts to stale. These symptoms indicate a violent inflammation of the kidneys, and not of the bladder, as it is commonly supposed to do. The sheep-skin in this case is an essential remedy, and must never be omitted. The bladder, however, is sometimes affected as a muscular organ, independently of the kidney. The symptoms, then, are different. The mus-

cles of the loins appear to be especially affected, and the horse appears as if he was chinked, as it is termed, that is, as if his back were broken, and some pressure was thereby made on the spinal marrow. The horse often drops down behind suddenly, and when he gets up, which cannot be done without great difficulty, he appears to stand for a time tolerably well: but on going forward, and especially when he attempts to turn, he often drops suddenly down again, as if his back were again broken. He seems to suffer intolerable pain when down in struggling to get up again. He appears anxious to stale, but is unable to stretch out, as it is termed, and appears trembling and fearful of attempting it. There is generally copious perspiration, merely, perhaps, from the pain he suffers. He is not unable to stale, especially at first, nor is the urine of an unusual colour, or very deficient in quantity; but the staling gradually becomes more frequent and the urine turbid, but of a light colour and less in quantity. All these symptoms are occasioned by a partial and at length a total paralysis of the bladder, and affection of the muscles of the loins, and not only that, for these again depend on a fracture of the back bone, which has previously been anchylosed, or rendered stiff by disease, and a consequent pressure upon the spinal marrow, which

becomes inflamed, and sometimes even suppurates. So important is the disease named *chill*, and especially what is named a violent chill, that not only the kidneys and bladder, but likewise the stomach, the lungs, the bowels, and even the heart itself participate in the affection. Sometimes the stomach is affected in a peculiar manner. The horse refuses his food, shivers considerably, has a peculiar appearance of uneasiness, the ears and legs are at first cold, and the pulse is quick and oppressed. After some time, or if the animal is not fully relieved by a copious bleeding, a swelling takes place in one or both of the hind legs, sometimes rather suddenly, and in a considerable degree, attended with violent pain and great heat in the limb. The animal is relieved, however, from his internal pain; the shivering ceases, the pulse becomes slower and more free, and the appetite returns. If a cathartic, or dose of physic be given at this period, and the ball is so made as to dissolve readily in the stomach, the consequence is likely to be fatal. The inflammation generally fixes on one part of the limb more than the rest; that part is generally the heel under the fetlock; it sometimes occurs, however, above the fetlock joint affecting even the joint or the sheaths of the tendons. These swollen parts are always exquisitely painful, and

the swelling terminates generally in sloughing. Sometimes enormous swellings of the legs are thus produced; and as the inflammation subsides, the swelling lessens, but the limb generally remains much swollen during the animal's life. It is of the utmost importance, when a horse is attacked with these muscular affections, in whatever degree it may be, to bleed even to faintness; but when the vital organs are affected also, such an evacuation is the only means by which the animal's life can be saved. The consequence of these attacks, when sufficient bleeding is neglected, whether of the muscles in general, of the hind or fore-parts only, or even if it be confined to the feet, is such as to render the animal almost, if not altogether, useless. Hence we have founder, pummice feet, chronic lameness, chest-founder, and other diseases, all which are absolutely incurable. But were the animal always bled on the first attack of those muscular affections named chills, and none of those poisonous drenches or balls given, which are commonly employed on such occasions,—were he bled to the full extent I have named, that is, to faintness, and kept cool instead of having clothes heaped upon him, and the stable shut up and made as warm as possible,—all these consequences would be prevented, and the animal

would speedily recover. A repetition of the cause, however, must be carefully avoided, as a second attack is more readily produced and more likely to prove fatal.

In some cases of over-exertion I have found the muscles of the back quite tender and pale; separated from their attachments to the spinous processess of the vertebræ and upper part of the ribs, and as tender as if they had been macerated a long time in warm water; the kidneys and lumbar muscles were also diseased, the heart much inflamed, and the lungs gorged with blood. In some cases I have found the spinal marrow inflamed; and, in one case, where I expected to find a fracture of the back, or dislocation of the vertebræ, from the inability of the horse to stand, and the palsy, that had taken place in the bladder, I found only inflammation of the spinal marrow, and an effusion of some yellowish jelly-like matter, probably coagulable lymph, in a canal which passes through nearly the centre of the spinal marrow, making it appear like two spinal marrows. The nerves going from it appeared to be inflamed. The bladder was large, but contained only a small quantity of urine; the neck of the bladder was quite open and flabby, and both had a peculiar unhealthy appearance. The horse was killed, and opened and examined immediately after. This disease

had at first the appearance of what is called a violent crick in the back, and if he had been bled freely and kept at rest might have recovered. But he was led a distance of five miles before he was bled and clystered, after which he was led back again. He would sometimes, while walking, drop suddenly in his hind parts and fall down, and could not get up without great pain and difficulty. He appeared to want to stale, but was unable to stretch himself out, and appeared to dread the attempt: a gush of urine at length came off, as if by a violent effort of the abdominal muscles. He was kept two days after this, but was at last unable to rise, and suffered so much that it was thought necessary to destroy him. The kidneys were slightly inflamed, which may have been owing to some oil of turpentine and other medicine that had been given him.

Chest Founder.

The existence of this disease appears to have been doubted by modern practitioners, and the lameness attributed by the ancients to this cause have been wholly ascribed to some disorder in the foot. I was formerly of the same opinion, and, perhaps, was led into it as well as others, by the circumstance of the feet being al-

most always affected at the same time. In justice, however, to the moderns, I must observe that the lamenesses commonly said to be in the shoulder are most frequently in the feet only, which has been completely demonstrated by the nerve operation, and that the ancients had but a very imperfect knowledge, even of the existence of such lamenesses.

Chest-founder is a consequence of those muscular attacks named chills, before described, and depends upon debility of the muscles of respiration, some of which are those that support the body and advance the fore-legs. The diaphragm also is affected in this disorder, and from this circumstance, in addition to that of the disorder being worse after considerable exercise, appearing as if the lungs were concerned in the attack, it obtained the name of bastard peripneumony. The symptoms of this disorder are a contracted motion of the fore-legs, and a diminished size of the muscles of the shoulder and chest, with a general weakness of all the supporting muscles. From these circumstances it is, that when chest-foundered horses are nerved, though they are certainly relieved by the operation, for the feet are almost always affected at the same time with founder, they step out much better than they did, but still appear to go as if they must cer-

tainly come down; and upon putting them to work, I believe, they always do tumble, and are therefore not essentially benefited, unless they are allowed a long run at grass. Chest-founder then is real, and not merely a nominal disorder; and the only thing that remains to be said of it is, that horses so affected are only fit for very moderate work in harness, and that all the muscles of the fore parts, as well as the muscles of respiration, are so affected as to render them unsafe and quite unfit for the saddle. Such horses, it is to be regretted, are sometimes employed in coaches and post-chaises, and urged to exertions far beyond their strength. Chest-foundered horses are generally those that have been possessed of considerable power and spirit, and, therefore, when fed high, and urged by the whip, will for a short period appear to go on with spirit, but after standing a little time in the stable they suffer great pain, and soon run their short course and die a miserable death.

On Founder of the Feet.

Founder of the feet, like the preceding disorder, is always a consequence of excessive exertion, in whatever degree it may exist, and is never produced, as is commonly supposed, by

sudden changes of temperature alone. There are two kinds of founder of the feet, the one chronic and the other acute. The latter has been before alluded to, as a consequence of what has been commonly named a chill, and is sometimes of so serious a nature, as to cause a separation of the hoof from the foot, and sometimes even of the foot and pastern from the leg. The disease, however, more frequently occurs in a less violent form: the foot becomes exceedingly hot and painful, insomuch that the horse is incapable of standing, except it is for a short time to feed. The shape of the foot becomes altered, losing its upright form, and falling down towards the horizontal line: at the same time, the sole, instead of remaining concave or hollow, gradually falls down, and becomes at first flat, then convex. In these less violent attacks the inflammation sometimes abates, and the effused blood remains within the front part of the hoof towards the toe, until the hoof grows down. It has been before observed, that this disorder may be prevented by bleeding to faintness, on the first occurrence of the muscular exhaustion, and consequent inflammation that is termed a chill; but when the practitioner is not consulted in time, and the feet are already affected, the best thing to be done is to employ the old operation, named bleeding in the toe, and this

must be done freely, by opening the arteries as well as the veins. A gallon of blood may be drawn from this part, when the operation is properly performed, and is the most effectual remedy that can be employed. The sides or quarters of the hoof should be rasped as thin as possible, and the sole pared away with the flat part of the drawing knife, until small spots of blood begin to appear; in short, the whole horny box must be made as yielding as possible. The foot is then to be wrapped up in a large emollient poultice, which should be often renewed and kept very moist. A dose of physic should be always given; there is not that danger to be apprehended from it in this case, that there is in that inflammatory attack of the hind leg, described in one of the preceding pages. In the former, there is a translation from the stomach, and a purgative may cause its return, and then the disease may end fatally; this is a translation from the muscles only, unconnected with the vital organs, and a purgative is always of great service. As soon as the horse is able to stand and walk a little, he should be turned to grass, and then left wholly to nature. The soles will soon acquire sufficient firmness to admit of his going to grass, and no artificial defence whatever will be required. Blistering the legs, however, has been recommended, and in such cases

may be tried. If the remedies above prescribed are unequal to the cure, the disease may be considered incurable. Chronic founder is so very common a disorder, especially in this country, that nearly two-thirds of our horses, by the time they have been in work a few years, are more or less affected by it. This almost incredible frequency of chronic lameness can be referred to two causes only. The first is the general practice of breaking young horses and putting them to work before they are four years old, and often before they are three. The second is the immoderate and violent exertions in which they are commonly employed. This kind of founder appears in a variety of forms, and has in consequence obtained a variety of names. A morbid heat in the foot is the most conspicuous symptom; this sometimes causes the heels of the hoof to approach each other and to compress the sensible frog, sometimes causing a discharge from that part; the disease has been then named contraction of the heels, and thrush. Sometimes the sole of the foot has become convex or projecting, and so thin as to be incapable of affording protection to the sensible sole. The disease is then named pummice-foot, or the ball of the foot is said to have fallen down. Sometimes the hoof and the sole have acquired such a degree of thickness, that their

elasticity is wholly lost, and the inclosed parts are suffering more or less from compression. In this case there is seldom any alteration in the form of the hoof; the lameness therefore is attributed to a strain in the shoulder, or the horse is said to be chest-foundered. Sometimes the lateral cartilages become ossified, in which case the lameness is only occasional—the horse is then said to have ring bones, or quittor bones. In short, chronic founder is a slow and almost imperceptible inflammation of the foot, producing all this variety of appearance, and obtaining different names. Palliation, or temporary relief, is the only good that can generally be accomplished. Contraction of the heels and quarters, and consequent thrushes, may with certainty be cured, but the lameness will almost always continue. Thrushes, however, may arise from other causes, which will be noticed hereafter. Pummice foot may be relieved by defending the thin and tender sole by a suitable shoe; but the form of the foot cannot be essentially altered. Compression of the sensible foot by a thick inelastic hoof may be completely, and sometimes permanently cured, by rasping the quarters of the hoof, and paring the sole, until they become so thin as to bleed, then stopping the foot with tar ointment, and keeping the horse at grass until a new hoof grows

down. One thing should be observed of chronic lameness, that, when it exists in a slight degree, considerable relief may be obtained by thinning the soles and keeping them stopped with moistened clay, and not with cow dung, as is commonly done, as that is of a putrescent nature, and liable to injure the frog, while this may be done even when the frog is already soft and moist; in that case, therefore, it should be covered with hoof ointment or tar. By thus keeping the feet moist and cool, some relief may be afforded in almost all cases of chronic founder, and may enable the horse to work moderately. But it is sometimes so bad, and the animal is constantly suffering so much pain, that nothing can afford relief but the nerve operation.

It has appeared in a great number of dissections of the feet of horses affected with chronic lameness, that the small bone of the foot, named *navicula*, or *nut bone*, has been diseased, either on that surface over which the great tendon of the foot passes, or that which articulates with the small pastern and coffin bone. Professor Coleman, I believe, is of opinion that the lameness arises from a want of synovia, and a consequent friction of the cartilaginous surfaces of the bones; for, however small the quantity of synovia may be, it must

prevent the actual contact of the surfaces. The continuance of this friction must in time abrade the bone: and were the horse kept sufficiently at rest, there would probably be an anchylosis, or an obliteration of the joint by an effusion of bony matter. This disease then may with propriety be called lameness in the coffin joint. I believe Mr. Turner, the Veterinary Surgeon, who is said to have first pointed out the frequency of this cause of lameness, is of opinion that the injury is often on that surface of the nut bone over which the tendon passes; for that also is a synovial surface for the tendon to move upon. When we consider the structure of this part, which may properly enough be called the coffin joint, and the fetlock joint, we shall find a striking resemblance between them. In the latter the two sesamoid bones have a synovial surface for the great tendon to move upon, and another for the metacarpal or cannon bone; and both, from the nature of their office, must be very liable to injury from immoderate work. The nut bone, from being so near to the insertion of the tendon, may perhaps be most liable. I have seen, however, the fetlock joint in the state Mr. Coleman has described the coffin joint to be, but it was in the hind leg of a post horse: and there was not only a want of synovia, but an ulceration in the synovial cartilage, both of

the metacarpal and the sesamoid bones. There was also another remarkable circumstance; the great tendon behind the pastern was changed almost wholly into bone, and considerably enlarged. The hoof had been suffered to grow very long at the toe, which no doubt contributed to the disease.

Mr. Goodwin describes a case of navicular lameness, as this chronic lameness is now generally called, which I shall take the liberty of transcribing. When Mr. Goodwin saw the horse, he had been lame two or three years: various opinions had been formed as to the seat of the disease, and every part of the fore leg, shoulders, and feet, bore the marks of a variety of operations, which had been performed, viz. firing, blistering, rowelling, &c. After having minutely examined the case, Mr. Goodwin gave it as his opinion that there was no prospect of relief; and that, notwithstanding the hoofs had every appearance of perfection, the cause of lameness would be discovered on dissection to exist in the feet. The horse was destroyed, that the feet might be examined by Mr. Goodwin. He found no reason whatever to believe that any change of the form or structure of the horn was the cause of the lameness; but on prosecuting the dissection, he found that a considerable degree of ossification had taken place in

the large flexor tendon which passes over the navicular bone: that there were adhesions between the bone and the tendon, the articular (or synovial) cartilages were much ulcerated, and the body of the bone had become carious: both feet were thus affected. Mr. Goodwin attributes this disease to the violent concussions which the feet are subject to when in strong action.

I once knew an excellent trotting horse that had won several matches: it was about the time that the thin-heeled shoe was thought a good method of improving horses' feet, therefore they were applied to this horse; but it was soon found that he could no longer trot, but when urged at all would immediately go into a canter. The shoes were therefore taken off, and the common shoe applied, but it was too late: he was no longer able to trot, and this I have no doubt was caused by an inflammation of the coffin joint, or parts connected with it, in consequence of lowering the heels and throwing so much stress on the tendon and the navicular bone.

To enumerate all the cruelties and contrivances that have been at different times practised for the cure of chronic founder, is not now necessary, because it appears to be universally known that none of them can do any good. This disease, in former times, was commonly

named hoof-bound, and that dreadfully painful operation of tearing off the sole was then commonly practised. The cruelty and inutility of this operation has been completely discovered, and is now quite given up; but it has been succeeded by firing, blistering, and mechanical contrivances for forcing open the contracted heels; and this contraction of the heels has been generally considered as the sole cause of the lameness. Mr. Coleman, however, soon discovered that the contraction could generally be removed, and a new and better hoof formed, but that the lameness was incurable. All the mechanical contrivances that have been suggested are, to say the best of them, useless. Firing and blistering are, I fear, still employed on those occasions, especially the latter. Neither of them can possibly do any good in any disease whatever of the foot; to employ them, therefore, when there is no other *visible* cause for their application, is an unnecessary infliction of severe pain, and a useless expence to the proprietor. A run at grass is after all the best palliative, except the operation I am now going to describe (which is known by the name of the nerve operation), and passing a seton through the frog. But with regard to the latter operation, though it may afford relief at an early stage of such lameness, and that relief

may sometimes be permanent if the horse is suffered to run at grass for some time, and afterwards worked with moderation; yet it must be obvious that no essential benefit can be derived from it in lameness of long standing. A bar shoe, or shoe thick at the heel, may sometimes afford a little relief. I have often remarked, in cases of chronic lameness, especially when the lameness has been fluctuating, that the horse sometimes goes pretty well, at others dead lame, as it is termed, without any apparent cause. In such cases I have often observed that the lame foot is colder than the others, from which it is probable that there is some derangement in the nervous structure of the foot. But even this may be considered as springing from the same cause, as all other chronic lamenesses of the foot, viz. early and immoderate work.

On the Nerve Operation.

This operation was discovered by Mr. Sewel, Assistant Professor of the Veterinary College, and communicated by him a few years ago to the Royal Society, and not by Professor Coleman, as stated in a former edition: a mistake for which I take this opportunity of apologising to Mr. Sewel.

This operation consists in utting out a por-

tion of one of the pastern nerves on each side. The portion cut out, he directs, should be one inch or more. Now as there are several branches of nerve on each side the pastern, though one only of a considerable size, cutting out a portion of that one must leave some degree of sensibility in the foot, and this appears to be sufficient. I have generally performed the operation above the fetlock, (see the Plate,) in order to destroy the sensibility of the foot entirely; but am inclined to think that the lower operation is preferable; and this, I believe, is the opinion of Mr. Coleman and Mr. Sewel. Mr. Goodwin, Veterinary Surgeon to his Majesty, is of a different opinion; and in his "Treatise on Shoeing," relates a case to prove that even in the higher operation the sensibility of the foot is after some time restored. "When it is performed," he says, "below the fetlock joint, there is less chance of the part operated upon being struck by the opposite leg, and sensation is more likely to be restored sooner than when performed above, in consequence of there remaining a small branch of the nerve, which goes undivided to the foot; but in laying the nerve bare in this situation there is more to cut through, which produces great inflammation and much swelling, and is often long in healing: yet

if the operation is performed above the fetlock joint, the inflammation and swelling are trifling in comparison to what it is when performed below the joint: I therefore on the whole prefer to operate above the joint." As the foot, though thickly covered with insensible horny matter, is naturally possessed of sensibility, there can be no doubt of the operation being essentially useful to the animal, and consequently to his rider also; but if this natural sensibility be increased by early and immoderate work, or by the other causes to which it is more frequently attributed, such as bad shoeing, &c. in whatever manner the foot acquires a morbid sensibility, I think it likely that the lower operation, in which a small branch of nerve is left undivided, will diminish it sufficiently to afford relief; and leave such a degree of sensibility in the foot as is useful to the animal.

To perform the nerve operation so as to render the foot completely insensible, the following directions must be followed, as being the best and easiest method I am acquainted with, and uniformly producing the desired effect. The incision should begin between three and four inches above the fetlock joint, that is, the most prominent part of the side of the joint, and extend downwards for one inch only. By making a free incision in the space that is felt

between the bone and ligament, and the tendon, the nerve may be almost immediately exposed; and it is only necessary to remove a little cellular membrane, and then it will be distinctly seen: one inch or more of the nerve is usually cut out. Thus the foot may be rendered absolutely insensible, and the lameness cured, if a proper subject has been chosen for the operation. But even if the subject is unfit, it may do some good, for in this case the horse will not go lame until the hoof is worn off, or he comes down upon his fetlock joint. There are many circumstances to be considered with respect to the nerve operation, and it is a subject of such importance as to demand a full and impartial consideration. Before this operation is performed, all the circumstances of the case should be carefully inquired into. If the foot is considerably deformed, if the front of the hoof has departed from the proper line of obliquity and approached towards the horizontal line, as will be explained by a diagram, (p. 179,) then a corresponding deformity will be found in the sole. These appearances indicate a disease of the sensible foot, which will proceed in its destructive career, more or less quickly, according to the horse's work, until he comes down upon his heels, and from thence upon his fetlock joint, and then of course he is unfit for every purpose.

Horses are often lame, as I have before observed, in the navicular bone, or coffin joint; sometimes suddenly from an anchylosis, or stiffness of the coffin joint; more commonly, however, it is produced by slow inflammation of the coffin joint and the parts connected with it from excessive work: it is also an effect or symptom of chronic founder. In all such cases the nerve operation is not applicable, and may do injury. For, though the horse would be immediately relieved by nerving, yet when put to work he would step out incautiously, and sooner or later fracture the adventitious ossification, and come down upon his fetlock joint. Mr. Turner is of opinion, that a much greater number of lame or foundered horses are thus affected than is commonly supposed, and, I believe, states the proportion to be no less than sixteen in twenty. Mr. Bracey Clarke, however, who is a very acurate observer, and a diligent inquirer after truth, states, that he has examined many lame horses after death, and finds the proportion to be much less than this. If I were to give an opinion from what I have observed in examining bones at the different kennels, it would certainly be in favour of Mr. Bracey Clarke's statement. However this may be, it is not of so much importance with regard to the operation considered in itself only, for

the nerve operation is seldom performed unless the horse is so lame as to be unfit for work; and then, if this fracture should take place, and the horse come down upon his fetlock joint, he is no worse than he was before the operation, that is, absolutely useless. But if a veterinary surgeon operates upon an unfit subject, and the case terminates unfavourably, it not only brings the operation into disrepute, but the practitioner also, if he should have led the proprietor to expect a favourable result: practitioners, therefore, should be cautious as to the prognosis they give, and as to the subjects they choose for the operation. Ossification of the coffin joint generally begins with the navicula, or nut bone; sometimes it occurs between the coffin and small pastern; it may also affect both: the lameness, therefore, which it occasions, is of various degrees, and may not prevent a horse from doing moderate work. There are seldom any external appearances by which its existence can be known, but sometimes there is a thickening and morbid heat about the coronet, accompanied by a short step, so that a horse is unable to trot, but goes tolerably well in a walk. It is worthy of remark, that the nerve operation with postmasters and coach proprietors is got into general disrepute, and for this obvious reason, that it has not succeeded in the horses they have

had nerved. But these horses have always been unfit subjects for the operation. When they have a lame horse, they continue to work him in their coaches and chaises as long as he has a leg to stand upon, without regard to the pain the animal suffers, or his utter unfitness for the employment. But by dint of whipping and high feeding, they contrive to keep him upon his legs for a short period; and when nearly exhausted, or done up, not only in the feet but in the whole muscular system, they expect from nerving a complete renovation. In many instances, however, such horses, that is, both post and coach horses, have been enabled to work again for many months after the operation: but it has generally, I believe, terminated either in the loss of the hoof, or in breaking down, as it may truly be called; for the fetlock joint comes down upon the ground, or the coffin bone comes through the hoof, and of course they are then absolutely useless. Thus, then, the nerve operation may prove unsuccessful from being performed on improper subjects, and the unfavourable termination is of two kinds. In the one, the horse breaks down; in the other, he loses the hoof, or the bone comes through the hoof or horny sole. This last termination may happen at different periods, varying, perhaps, from one month to two or three

years. Breaking down, in consequence of the nerve operation, depends upon the foot being previously in that state which is called pummice-foot; or from the ball of the foot being down, as it is termed, or from an ossification in the coffin joint, or in the articulation between the small and large pastern. These states of the sensible foot often exist together; and when the horse steps out more boldly in consequence of being relieved by the nerve operation, the ossified joints are generally, and I believe I may say always, fractured, sooner or later, and then the horse breaks down, as I have described. It should be observed, that it sometimes happens that a horse becomes strained in the back sinews, as it is termed, after the nerve operation; that is, a painful swelling takes place in what is called the sheath of the tendon. This also arises from the horse stepping out freely, after the parts had for some time been unaccustomed to such extension; in doing which, he breaks that vascular ligamentous and delicate membrane which connects the perforatus tendon with the perforans, about mid-way in the leg. A similar band may be found also between those two tendons in the pastern. I have known this accident occur in a nerved horse at grass, and he got well again and continued his work. Loss of the hoof,

the other unfavourable termination of the nerve operation, may depend on one of the two following circumstances. If a horse after being nerved happens to be pricked in shoeing, or if he becomes gravelled, as it is termed, such accidents do not occasion lameness, and therefore sometimes escape notice until matter has formed in consequence, which, from being confined by the horn, often penetrates between the sensible foot and the hoof, so as to separate them, either wholly or partially. In this case, the foot may be restored when it arises wholly from either of the above causes. Sometimes, however, it depends not wholly upon this circumstance, but upon another also, of far greater importance. It has been a subject of admiration and astonishment, that although the nervous communication with the foot has been completely cut off, the secreting arteries, as they are termed, not only continue to perform their functions, but perform them more freely and with more ease; there being more hoof formed, and that, too, frequently of a better quality, that is, less brittle and more elastic than that which they formed previous to the operation. This, I believe, has never been explained; and, to understand it, it is necessary that the reader should be informed that the heart is supplied with nerve, by the eighth pair, or par vagum, and the great inter-

costal or sympathetic nerve. This supply is extended to the arteries throughout all the circulation, and at their extremities furnishes them with that power on which their functions depend, that is, secretion. This may be called their sensorial power. Their sentient power is another thing: this they derive from the spinal nerve, which is cut away in the operation. The secretion of hoof is a circumstance that is not generally understood. When we consider the quantity of horn that is formed, the purposes it is designed for, and the qualities with which it is endued, it will then appear what a quantity of blood is required for the purpose, and what power also in the secreting arteries. The excessive exertions in which horses are generally employed in this country are such that their sensorial power is greatly diminished at an early period of life, and that more especially by the absurd and ruinous practice of breaking and working them so early as is done. From this cause, and from the vessels of the foot having their action so much increased, in those violent exertions, the loss of their sensorial power would not be an uncommon occurrence, and the loss of the hoof would of course be often happening without the nerve operation, were it not for the additional supply of sensorial power they derive from the meta-

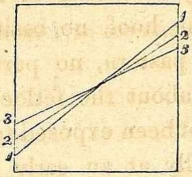
carpal nerve, through its connexion with the great sympathetic. Therefore it is that post and stage-coach horses more frequently than others lose their hoofs after the nerve operation: for they are those that are most commonly and most constantly employed in hard work; are often purchased in a state of lameness or debility, and too frequently made to continue their labour until they are completely exhausted. Such are the horses that have been the principal cause of bringing the nerve operation into disrepute. With hunters the operation has, I have been informed, in two cases, so far succeeded, as to enable them to return to their work for two seasons. Horses employed in hunting, work harder than coach or post-horses at times, but they are treated with care, and the slighest lameness is always attended to, and obtains for them sufficient rest. A real sportsman knows the value of his horse, has a regard for his feelings, and never pushes him but when there is occasion for so doing. We sometimes hear, it is true, of young and inconsiderate sportsmen riding a horse until he drops from complete exhaustion, and of some who have been foolish enough to boast of such an exploit. But this is not often the case; on the contrary, they are generally treated with care, and are allowed a summer's rest at grass

to recruit their power, and return to their labour with spirit and energy. Having pointed out the causes of the failure of nerve operation, I shall conclude the subject by making some general observations on its usefulness, which I am satisfied is considerable, and of great importance to society. In determining upon the expediency of performing the nerve operation, it is necessary to consider, not only what probability there is of its being successful, or in what degree it may be so, but likewise whether the chance of cure is equal to the expense of the operation, and that of keeping the horse before he is fit for work. I say expense of the operation; for the after treatment should cost nothing, as no kind of dressings or bandages are required. The only thing to be done after the operation, is to close the skin with one stitch, and then leave it wholly to nature, except during the first week, when it will be proper to spunge the leg several times a day with tepid water. After this the part should not be touched on any account. The stitch will give way, and the wound appear open after the fourth day; but this should never be attended to. The expense of keep need not be considerable; for after the first week, or even before, he may be turned to grass, where he should be kept two months; and then may be put to work. Now, if the

expense of the operation, and the expense of keep can be afforded, there can be no objection whatever to the operation. Relief from pain and lameness is in almost all cases immediate and certain; and the duration of this relief, if limited, may extend to a period of some months, or even years; and so complete is this relief, that during this period the horse may do considerable work without suffering pain. But there are cases of lameness where the relief it affords is complete and permanent. These cases may be known by there being no deformity in the hoof, no ossifications about the coronet or pastern, no particular appearance of injury about the fetlock joints, when the horse has not been exposed to excessive exertions, especially at an early period of life; and this, perhaps, can only be known by inquiring into the history of the animal. Were a horse kept at grass until he is five years old, the exertions which now ruin him, and commonly do him up, as it is termed, in two or three years, would do him no injury. As it is, they are generally taken up at three years old, seldom left out till four, and often put to work even at two. While breeders and proprietors are so blind to their own interest as to go on in this way, and while horses are worked as they now are, the nerve operation may be considered

a valuable addition to our stock of veterinary knowledge. One good, I hope, will result from it, in addition to what I have described; that is, it will completely put a stop, to the cruel practice of firing horses, in cases where it cannot possibly do any good.

The following diagram shows the different degrees of obliquity in the hoof, as it regards the nerve operation.



Figures 1, 1. The line showing the healthy degree of obliquity.

Figures 2, 2. The first degree of pummice foot.

Figures 3, 3. The greatest degree of pummice foot.

Explanation of the Plate of the Nerve Operation. [Plate I.]

This plate of the nerve operation shows the two methods that have been commonly em-

ployed in performing the nerve operation. The method I now recommend may be understood also by the same plate. It is of importance to observe that the nerve should not be divided with a keen knife (a curved bistoury, when it cuts well, is the most convenient), but by a drawing cut, so as to derange the nerve as little as possible. When it is done with scissars, there is a thickening always left, which is extremely tender, and sometimes productive of lameness, especially when struck.

Description of Figure 1.

a. Part of an eye-probe bent, and the curved part passed under the nerve.
b. The nerve.
c. The vein.
d. The back sinew.
e. The suspensory ligament.

Description of Figure 2, or the pastern Operation.

a. The large branch of the nerve, and that from which a portion is to be cut out.
b. the artery.

This is best explained by the plate itself, instead of the outline, fig. 2. The skin is drawn back by two hooks. The artery is co-

loured red, the vein blue. The large branch of the nerve is seen behind, and close to the artery; a smaller branch is shown between the artery and vein.

I have lately performed the operation in a higher situation than that marked in the plate; that is, at the top of the incision marked *a*, in the plate. When performed in this part, the nervous communication with the foot is more completely cut off, and the cicatrix is quite out of the way of being struck with the other foot. In this part the nerve lies rather deeper, especially on the inside of the leg, than it does nearer the fetlock joint, but there is no difficulty in finding it by carefully dissecting away a little cellular membrane. Half an inch of the nerve is sufficient, I think, to be cut out, but one is more commonly thought necessary, and the incision in the skin need not exceed one inch. The operation must be performed on both sides of each leg, for the metacarpal nerves do not correspond with the artery. After the nerve has been cut out, the wound should be closed with one stitch, and no kind of bandage, plaster, or dressing, should ever be employed. During the first week, the leg should be sponged with tepid water, several times a day, and then the horse may be turned to grass, where he should be kept two months. The stitch ulcerates and

gives way in four days, and the wound opens; but this need not be attended to. When the operation is performed in the pastern, the large branch of the nerve only is to be cut out, and this lies behind, and close to the artery; but some thread may be passed under it with a crooked needle, so as to raise it up, in order to be cut.

CHAPTER XIII.

ON STRAINS.

By the term strain is generally understood the excessive extension of a part, and the parts commonly considered as liable to such accidents are the muscles, the ligaments, and the tendons with their appendages. This opinion is correct, as far as it goes; but strains are generally of a more serious nature, and depend on a rupture of some of those parts. It is unnecessary to dwell long on this subject; the nature of those accidents has been already explained in a general way, and to speak generally of the cure, till fewer words are necessary. Bleeding to the extent of six quarts or two gallons, is the first remedy to be employed, but not the most essential; for without rest, absolute rest, until the inflammation has subsided, nothing can do any good. It may be supposed that this copious bleeding is applicable only to severe strains, or strains of important parts; but it is the best practice in all strains, in whatever part the may occur, or in whatever degree. With respect to strains of particular parts, though the essential remedies, bleeding and rest, are in all

of them necessary, the situation o the part may admit of some variation in the use of local or subordinate remedies ; a description of each may also be necessary ; therefore, as in the former editions, each will have a separate consideration.

Strain of the Shoulder.

Injuries of the shoulder occur more frequently than veterinary surgeons seem disposed to admit; they do not, however, often occur in such a degree as to constitute what may be called a strain. Young horses, during the time of breaking, are generally the subjects of such accidents, especially when they are taken up and broken at the early age they now commonly are. They are not, it is true, often so violently strained, that the lameness comes under that denomination, but the lameness of colts is almost always of this nature ; and, unless it is violent, and the lameness such as to prevent the extension of the limb, rest alone, by turning them to grass, will effectually restore them again. Shoulder strains often occur to troop horses, but then the disease is so well known, and so judiciously treated, that nothing need be said on the subject. A shoulder strain may be distinguished by the difficulty with which the animal extends the

limb, but especially in moving forward, by an apparent motion of the fore leg outward in a curvilinear direction. This, however, is only apparent, and is occasioned by his throwing himself on the opposite shoulder in order to take off the weight as much as possible from that which is strained. In doing this, he inclines his head and neck on one side, and it is thus the fore-foot describes a curve in moving forward. In violent strains, the difficulty of moving the limb is such as to prevent extension almost entirely. At others, it is inconsiderable, and attributed to a splent or a strain of the fetlock joint. As to the treatment of this kind of strain, whether it be violent or not, the remedies are the same, that is, copious bleeding and rest. The rest should be continued as long as the animal feels it necessary, for he should be kept loose in a box where he may either move or stand still, as may be most suitable to his feelings. It may be thought that copious bleeding in strains, which are not violent, is unnecessary, and that rest alone may be sufficient. But if it is desirable to cure the animal in the speediest way possible, then bleeding and copious bleeding, should never be omitted. The horse's diet should be light, and of an opening nature: grass is by far the best. A dose of physic may be given. A rowel, or rather a seton in the

chest, is useful. No other application whatever is necessary. As for those vile farragos, named strain oils, it is to be hoped they will be completely expunged from our materia medica, as much on account of the useless expence to which proprietors are frequently put in purchasing them, as of the mischief they frequently do. When the inflammation is so far abated, that the horse appears capable of moving himself with some degree of ease, he should be turned into a small paddock, when his exercise may be increased, and from thence, when he is fit for the change, into a field. In violent shoulder strains, the muscles are sometimes ruptured or torn. In this case some time is required for their healing, and rest is more particularly necessary. When this has been accomplished, lameness will often remain for a considerable time, the muscle having become shortened, in some degree, or its action more confined. In such cases swimming has been proposed with a view to a gradual restoration of the contracted muscle. The advantage o this will readily appear, when it is considered that the affected muscle is one of those concerned in the support of the body. In swimming, then, the full extent of the limb may be obtained, while the weight of the body is supported by the water. I have known complete

success result from this treatment in very severe and obstinate case of shoulder strain, after severe blistering and other remedies had proved ineffectual. In this case, it should be observed, the horse was kept constantly in a stall, tied in the usual manner, so that he was not able to move himself about, which he would have done, and probably would have been cured by it, had he been treated as above directed. Blistering the shoulder is useful when bleeding has been neglected for some time. Lameness in the shoulder is sometimes caused by blows on the point, or projecting part, which may be known by its being swollen and tender: for this blistering is the best remedy. I have seen horses become lame or stiff in the shoulder from the friction of mud between the arm and chest, or between the skin and the girth: this is soon cured by bathing it well, and applying a little sweet oil or hog's lard.

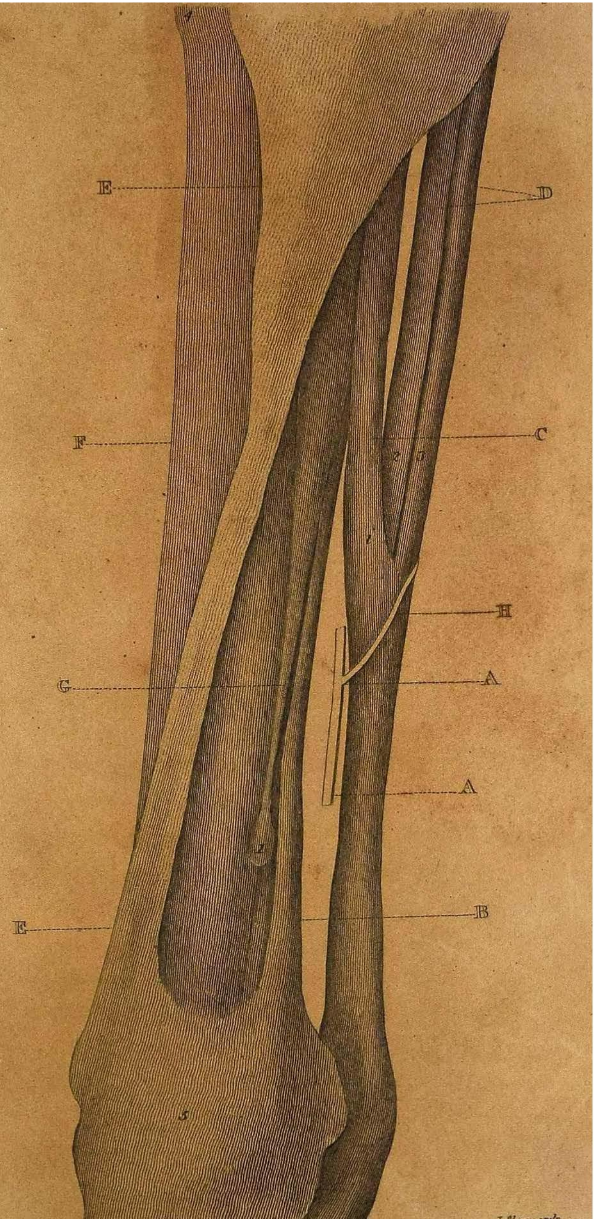
Strains or Injuries of the Muscles of the Loins or Back, and of the Spine or Back-bone.

These accidents generally occur to draught horses, especially to those that work in the shafts. They commonly happen while the animal is going down hill with a heavy weight, or

in backing hastily, and in an improper manner. The muscles most commonly affected are those named psoæ. Sometimes the dorsal muscles are injured also, but not often. This accident seldom occurs alone, and is sometimes accompanied with a dislocation of the pelvis from the transverse processes of the sacrum. The disease is then named chinked back, or broken back. Sometimes the accident is of a still more serious nature, being accompanied with a fracture of the spine or back-bone. In this case, however, there has generally been a disease in the spine previous to the accident. The spine of the back is composed of many vertebræ, as they are termed, which are joined together in the strongest manner by ligaments, so that the motion, with respect to two vertebræ upon each other, is inconsiderable, being trifling compared with the strength required in the part; but the motion, with respect to the whole spine, is considerable. When horses have been much employed in carrying heavy burthens, that is, burthens disproportionate to their natural strength, more especially when such burthens have been kept on their backs a considerable time together, a slow inflammation is induced in the ligaments which unite the vertebræ, and in consequence bony matter is deposited, and the little motion they had is entirely put a stop to. This may truly

be considered as an effort of nature to strengthen a part which had been so improperly oppressed. It is this anchylosed, or stiffened spine, that is fractured on those occasions, and the consequences are generally fatal. The symptoms by which a simple muscular strain of the back may be known, are those of a negative kind; that is, by the absence of those by which the other two kinds of injuries are characterized. In chinked-back, the motion of the hind parts is very peculiar, and cannot well be mistaken. The horse in moving, and especially when he trots, appears as if some new joint were formed in the back; the hind parts moving laterally in some degree, while the animal is going straight forward. This description will be sufficient to convince the reader what the complaint is the moment he sees it. Broken back is of a more serious nature, and gives intolerable pain by the pressure which the broken bone makes upon the spinal marrow. This is particularly observable when the horse attempts to turn, for at such times, probably, a splinter of bone wounds the spinal marrow, and causes him to fall down suddenly upon his hind parts, and from thence upon his side, in the most exquisite pain imaginable. Paralysis, partial or total, of the hind parts, and of the bladder, is always a consequence of this accident, as has been before de-

scribed. The spinal marrow at length inflames, and sometimes suppurates, but not often, as death generally puts an end to the animal's sufferings, before there is time for it to take place. There is no remedy for this accident, therefore the horse should be immediately destroyed. When the back is chinked, the horse should be plentifully bled, and the loins and back should be covered with a fresh sheep's skin; he should also have a clyster and some cooling and opening medicine. At the end of a week, if the horse has been bled sufficiently, the inflammation which the accident occasions will so far have subsided, as to admit of his being turned to grass, where he should remain about a month. He may then be employed in gentle work, but not in drawing, of which he is ever after incapable in any useful degree. Horses never recover completely from this accident, but always go in the manner I have described. This dislocation may take place in different degrees. I have seen a case of partial dislocation in which the horse so far recovered as to become useful again, but there was still something in his manner of going, which would lead an experienced person to suspect what had happened. With respect to that injury of the muscles only, which may be properly called a strain, there is nothing to be done but bleeding



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copiously, giving clysters, rest, and covering the back and loins with sheep's skins. When the inflammation has subsided, a run at grass must be allowed, until the muscles are completely restored. Inflammation of the spinal marrow is sometimes a consequence of these accidents; also inflammation of the kidneys and hæmaturia, or bloody urine.

Strain or Injury of the Stifle.

There is a peculiar affection of the stifle-joint, which has been mistaken for a strain, and has not hitherto been sufficiently explained. I have noticed it, however, in my Veterinary Dictionary, and in former editions of this volume, and in the first volume, but did not account for it in a satisfactory manner. I now think that it depends upon a horse endeavouring to avoid cutting, that is, by his endeavouring to go wide behind, and throwing out the striking leg, in order to avoid that which receives the injury. In doing this, the muscles named abductories have more than their share of labour in travelling; and in consequence of this, when he happens to be suddenly moved in the stall, there

is a want of harmony in the action of the muscles, and thereby the patella is partially displaced. This causes the horse to keep his hind leg extended a short time, and in considerable pain. The balance of power, however, between the abductores and abductores muscles, will be soon restored, and the patella will fall into its place again, with a noise that can be distinctly heard. The description I have given points out the reremedy. The disease is only of a temporary nature, and goes off as soon as the cause is removed. No application whatever is necessary. The stifle-joint is liable to other injuries, and these are of so serious a nature, as generally to render the horse useless. They consist in a rupture of one of the ligaments of the patella, and a consequent dislocation of that bone. This accident is incurable: but the horse should be turned to grass, to take his chance. Another disease of this joint is an extension of the capsular ligament from excessive exertion, long continued, and perhaps often repeated. In consequence of this there is an increased secretion of what is called joint oil. Nothing but long rest can do good in this case, and this may render the horse fit for moderate work. Blisters are commonly employed, but I am inclined to believe they seldom do good. Fractures of the

patella may occur, or fracture of the tibial ligament. I have never met with such cases; and if they do occur, they must of necessity render a horse useless.

Strain, and other Injuries of the Knee-joint.

The knee-joint of the horse corresponds with the human wrist, and the stifle joint with the human knee. Strain of the knee-joint is always accompanied by that very common accident, named broken knees, and is therefore with difficulty distinguished. Rest, however, and bleeding, must here be employed; for if the case prove to be simply a broken knee, bleeding is extremely useful. In whatever degree the knees may be injured, whether complicated with a strain or not, an emollient poultice is the best remedy, applied by means of the leg of a worsted stocking, and confined by listing, or a flannel bandage, and not by a cord, especially below the knee, that the ligature which confines it may not be tighter than is absolutely necessary; and above the knee a ligature is unnecessary, as the stocking may be kept in its situation by supporting it with listing or tape brought over the shoulder. When the inflammation has by this means been subdued, which

may happen in a few days, or a week, according to the degree of the injury, the poultice should be left off, and the following paste applied once in two days, washing or soaking off the scab previously to each operation.

Paste for broken Knees.

Pipe-clay and alum, equal parts. Let them be finely powdered, and mixed with water into a thin paste, of the consistence of cream. This paste soon gets dry, and requires to have water added to it each time it is applied. It is sometimes necessary to use a stronger application, such as red precipitate and burnt alum; after the wound is healed, apply tar ointment coloured with lamp black or bole.

Strain of the Flexor Tendons or Back Sinews.

These are by far more common than any other strains, and often do considerable injury. The nature of these accidents is not generally understood, and in order to explain the mode of treatment, it will be necessary to give a short description of the part. For this purpose I have provided a Plate, which I hope will make it sufficiently clear and intelligible. The flexor tendons, or back sinews, are the appen-

dages or ropes to the flexor muscles, which are situated chiefly on the back part of the fore-arm of the horse; when these muscles are full or prominent, tapering downwards in a sinewy form, it indicates great strength of the fore-leg, and the sinews will always be found of corresponding strength. The elbow in such a fore-leg is generally standing out from the side, and not turned in and concealed, as it is in fore-arms of a different description, in the side of the chest or sternum. These sinews are two in number, and the one is enclosed in the other, so that the latter forms what is termed a sheath for it. The inner tendon, or, as it is named, the perforans, is one of great strength, nearly round, and extends down to the bottom of the foot, or coffin bone, into which it is firmly implanted. The other, or sheath, named perforatus, is considerably thinner, forming indeed a mere sheet of tendon, especially at those parts where wind-galls happen; these were formerly supposed to be enlarged bursæ mucosæ, but I have clearly demonstrated that they are nothing more than the tendinous sheath, or perforatus tendon, distended with synovia; and I shall also show that wind-galls may be opened with safety, when that subject comes under consideration. These, then, are the two tendons, which, taken together, form the back sinews. Between these two tendons,

there are in two parts thin vascular membranes by which they are joined together; these membranes appear to serve as bridles, allowing the perforans tendon to move a little way within the perforatus, and then preventing any further motion. The situation of those membranes is about midway in the leg and midway in the pastern. If the coffin joint happen to be extended in a way the animal was not prepared for both these membranes are ruptured. The consequence is an effusion of blood between the two tendons, whereby all motion between them would be effectually prevented, were the animal permitted to obey his own instinctive feelings. During this time the membranes would heal, and then the animal would move himself sufficiently to bring on some degree of motion in the parts; in doing this the blood, which would have become fluid again, would be gradually reabsorbed. Grass, however, is not a fit situation for a strained horse, as there he is liable to be alarmed by different circumstances, and may be led to exert himself in a way that may render the strain incurable. He should always be turned into a box where he may be enabled to take more or less exercise, as his feelings may direct. Bleeding is in this case also the most essential remedy. The only application required, and a most important one it is, is an

emollient poultice, so applied as to extend from the hoof to above the knee. This may be done most conveniently by means of a long flannel bag, that will be long enough to admit of being tied round the hoof, and reach from thence to about eight inches above the knee. This bag being applied and secured by tape or listing passed over the shoulder, is to be filled with the following poultice.

Take two quarts of bran, and pour on it as much boiling water as will bring it to a very thin consistence; let this stand for about ten minutes, then stir in with it half a pound of linseed cake powdered and sifted; with this poultice let the bag be filled. This poultice should be renewed once in twenty four hours, but in the intermediate time should be moistened frequently by pouring a little tepid water into the bag. In strains, the bowels should be attended to; a moderate dose of physic may be given, and a clyster, in the first instance; after that nothing more will be required; a strained horse will of course be kept on a cooling opening diet, especially grass, when it can be obtained. This poultice will keep the whole limb in a perspiring state, will effectually prevent motion in the knee joint, and at the end of a week must be left off. The strain will then be in a great measure cured, but the horse must remain in the box from two

to three weeks longer: the strain will then be completely cured, however violent it may have been. Should any heat or swelling remain, the part may be spunged with diluted vinegar, or a solution of salt in water. He may then be put to work: a run at grass is not necessary, as it is in muscular strains. I must now return to a description of the fore-leg, there being other parts besides those I have mentioned that may be injured in strains. It will be seen from the Plate that there is a strong ligament, but in appearance like a tendon, coming from the back part of the knee, passing down about four or five inches, and then incorporating with the perforans tendon. This I have named the great ligament of the back sinew, and its office is of a very important nature, being no less than that of supporting the whole body; that is, supposing the flexor muscles to be fatigued, and incapable of doing it, and in consequence giving way; for in that case this great ligament forming one rope with the great back sinew, and this sinew being firmly inserted into the bottom of the coffin bone, it must of necessity be the sole support of the whole weight. This ligament may also be ruptured in strains. I have seen a case of this kind, and such must have been the cases that have been described as a rupture of the back sinew, an accident, as must be obvious

from the plate,* that cannot happen. One part only remains to be described, and that is the suspensory ligament. This ligament passes down from behind the knee close to the shank bone, until it arrives to within three inches and a half of the superior and posterior part of the

* This plate shows also a branch of nerve which crosses over the back sinew, to join the nerve on the opposite side. It must be observed, however, that the nerve is represented crossing in too perpendicular a direction, and joining the great nerve on the outside of the leg a little too high. The distance between the part on the inside nerve, where the branch is given off, and the part on the outside nerve, where it communicates, is about two inches, or within two inches and a half, for it varies a little in this respect. The plate may, without this explanation, lead the reader into an error.

A. The outside nerve, or that part of it where the branch H communicates. B. The suspensory ligament. C. The great ligament of the back sinew. D. The two back sinews, or flexor tendons. E. E. The extensor tendon. F. The cannon or shank-bone. G. The splent bone, which is placed on each side, rather posteriorly, of the shank-bone, beginning immediately under the knee, and extending tapering downward, and terminating at fig. 1. in a sort of bulb. H. The back sinews and their great suspensory ligament, apparently joined together. This, however, is not the case; it incorporates only with the perforans tendon, marked fig. 2; and so intimately, that they form one and the same substance, at the part marked by the small letter i. The perforatus, marked fig. 3, forms a sheath for the perforans, as already described in the article strains. 4. The knee-joint. 5. The fetlock-joint.

sesamoid bones; at this part it divides into two branches, which diverge from each other, and embrace the sesamoid bones laterally, so as to keep them firmly in their situations; it then passes downward, and obliquely forward, and gains the extensor tendon about midway, in front of the pastern. This ligament is the chief support of the fetlock joint, and is sometimes ruptured in one of its branches: such accidents may always be known by a protrusion of the sesamoid bone on the same side. The treatment I have described for the first accident is equally applicable to both of these; nothing more is necessary, unless it is, that, when the protruded sesamoid is observed immediately after the accident, an attempt may be made to return it, and confine it in its situation by a bandage.

Strain or Injury of the Fetlock Joint.

These joints are of great importance to the horse: they receive, from their oblique position with respect to the legs, the weight of the whole body, and form that important spring which enables him to perform his wonderful exertions with ease to himself and pleasure to his rider. From this circumstance, they must of course be liable to very severe injuries, and these injuries, it is to be regretted, are seldom or never

curable; that is, considered as saddle horses; but as draught horses, they may be sufficiently restored for slow and moderate labour. This accident occurs only by a rupture of one of the branches of the suspensory ligament, and a consequent displacement of one of the sesamoids; a case which has already been considered. It is necessary here to make some remarks on the absurd and mischievous practice of trimming horses' legs; that is, cutting off parts which were designed by the Almighty for a useful purpose, that of defending the pastern; whereby they expose an important part to injuries. The fetlock, as it is termed, is found in all horses, especially in those of the northern breed, and from its position is an admirable guard against thorns, furze, flints, or other bodies, to which the pastern, without it, is so much exposed. The only excuse for this foolish practice is, that it is customary and makes a horse look clean about the legs: and this notion is carefully preserved, and impressed upon the minds of those inexperienced in horses, by the men employed to operate on the occasion. To such an extent is this absurd practice carried, that in Exeter it has become a distinct profession, for there is one man I know who appears to make it his sole employment. The hairs covering the back part of the legs, and fetlock joint, are always indicative of

the horses' breed. In those of northern climates it is strong, abundant, and an excellent protection against accidents. In the Arabian and barb it is thin, silky, and highly ornamental. The English race-horse being a mixture of the Arab and the barb, with a very small proportion of the northern blood, has this ornament in nearly as great a degree as the Arab or barb. The English hunter has it in a less degree, but in sufficient quantity and strength for the defence of the pastern against furze, thorns, and flints; but there are many who thin or trim out the fetlock and pastern in such a manner, in order to make the horse appear well-bred, that it is made inadequate to the purpose for which it was intended. Hence it is that punctures and wounds in the back part of the pastern are so common as we find them. Wounds of the pastern, from the imprudent practice I have just described, often occasion severe lameness, and sometimes of considerable duration. They are generally occasioned by small thorns, which having entered the sheath of the tendon, are, from the hardness of the perforans tendon, turned on their side, and rendered less injurious than they would otherwise be; but even then the irritation they occasion is such as to produce a dreadful degree of lameness, and even locked jaw. This severe injury, however, is not com-

mon; more frequently the entrance of the thorn is effectually resisted by the sheath, so that the point is turned upward or downward, and the thorn laid flat on its surface. But most commonly the thorn is turned in an oblique direction by entering the skin, and both the tendon and its sheath escape injury. Whenever these accidents occur, it is of the utmost importance to remove the thorn as speedily as possible, and this can be done most readily with the instrument named dissecting forceps. The thorn will always be found in an oblique direction, and must be sought for accordingly. The search will always be successful, if careful, and in time. After the thorn has been extracted, an emollient poultice should be applied as long as it is necessary. The next and last injury of the pastern to be described, is the rupture of the ligament, which binds the two pastern bones in their situation, and may therefore be named the pastern ligament. It is represented in Plate 10, of Volume I. and is lettered *d, d, d.* The same Plate represents the sesamoid bones covered with the perforatus tendon, forming that strong slippery surface for the perforans, or foot tendon, to slide upon. All the posterior part of the sheath has been removed, as well as the perforans tendon, to expose this surface, which is marked *a.* The letter *e* shows the insertion of the pastern liga-

ment, and *g* the insertion of the foot tendon, which has been removed in order to show the part as well as the pastern ligament, and sesamoid surface on which the foot tendon moves. The letters *f*, *f*, show the lateral cartilages of the foot.

The pastern ligament is most liable to be ruptured in race horses, owing to the length and obliquity of their pasterns. This form, however, is an essential requisite in the race horse, being the principle of that wonderful series of springs, which, with his superior muscular energy, depending upon his blood, enables him to make such astonishing and almost incredible bounds as he does in racing. Eclipse, it was ascertained, covered a space of no less than thirty feet at every bound, during a severe contest in racing. The bounds made in trotting, especially by the mare named Phænomenon, were no less astonishing. They amounted to thirty-six feet, during a contest against time; and on the same occasion she went, for a certain distance, at the rate of twenty-two miles an hour. Her continuance was no less remarkable: she completed nineteen miles within the hour. Such is the wonderful power of the horse. A rupture of the pastern or the suspensory ligament then, is one effect of those astonishing exertions, and when it happens, the horse immediately comes

down upon his fetlock joint. This constitutes the accident called *breaking down* in racing, and it is so far incurable, that the horse never recovers sufficiently to be used as a saddle horse. The consequence always is a ring bone, or an ossification about the pastern, to a greater or less extent. In some cases the bony matter is formed so abundantly, that it completely surrounds the tendons, without impeding their motion considerably. Such fractures, however, may be partial only, and the effect will of course be proportionate. Poultices and rest, with one copious bleeding, are the remedies for such accidents.

Strain of the Coffin Joint.

This is an accident which frequently occurs, and in general is either neglected or very improperly treated; for when it happens, the cause is not often suspected, and if it is, the applications employed are very injurious. But when this is supposed to be the cause of lameness, an examination takes place, and the shoe is generally removed. The drawing knife then goes to work, and the nail holes are scooped out in order to determine whether the horse has been pricked or not. Nothing being found,—

though often much mischief is done in this *searching*, as they term it; so much so, that gravel sometimes works into the *searched* part, and causes lameness,—the investigation is extended to the other parts of the limb, and some one is frequently fixed upon as the seat of the injury. This accident may be known by the horse going very lame in attempting to trot, but walking with very little lameness; by great heat of the foot extending to the pastern, and sometimes a swelling about the coronet. Another circumstance must always be attended to, that is, the absence of all other appearances which may satisfactorily account for the lameness. The shoe being removed, and the sole thinned with the drawing knife, the whole foot and pastern should be wrapped up in an emollient poultice. Bleeding as above described is just as essential in this case as in any other strain; and when it is done freely, and in season, an incurable lameness may often be prevented, especially when the blood is drawn from the toe. But these strains, though apparently inconsiderable, are of a very serious nature, and the cause of one half of the chronic lamenesses so commonly occurring. These are the cases described in the section on the Nerve Operation, in which it was stated that ossification had taken place about the coffin joint; for such is always the termination

of those strains when the treatment I have directed is not implicitly followed. These cases sometimes render the nerve operation ineffectual, for the new or adventitious ossification is liable to be broken by the bold step which the horse is enabled to take. A dose of physic may be given in this strain. The poultice should be continued about a week, and the horse suffered to remain in the box for three or four weeks longer. Blistering is unnecessary when the above remedies are seasonably employed; and if the lameness has continued some time they are useless, because the disease is incurable.

Strain and Injuries of the Hock-joint, and Parts connected with it.

The hock is a very important joint, perhaps the most important in the body. It is more frequently injured than any other part; and these injuries are almost always the effect of excessive exertion. Diseases of the hock-joint have had distinct names applied to them, by which they are familiarly known, and therefore I will explain them under these terms, which are, Bone Spavin, Bog Spavin, Blood Spavin, Thorough Pin, and Curb.

CHAPTER XIV.

BONE SPAVIN.

THIS is a very common disease, and consists of a deposit of bony matter about the bones of the hock, so as to hinder their motion in a certain degree. But previous to an explanation of this disease, a concise description of the joint may be useful. The hock is composed of six bones, the only ones of which that deserve a name are, the os calcis and the astragalus. The other four bones are considerably smaller, and have been distinguished by names, which need not be mentioned. The astragalus is a very curious bone, and is placed obliquely in the shape of a pulley. It is articulated with the leg bone, or tibia, and below, or rather posteriorly, with the os calcis; and such is the nature of these articulations, that a most extensive motion is afforded to the shank bone, or cannon. Between the astragalus and the tibia there are two moveable cartilages interposed, similar to those in the human knee, named semilunar cartilages. These facilitate motion in a most wonderful and curious manner, and this they are enabled to do by a large supply of synovia,

from a gland situated in the posterior part of the lower end of the tibia. It is generally supposed that the synovial fluid is secreted by the cartilage covering the ends of the bones forming a joint, or by a membrane, named perichondrium, which covers the cartilaginous surface, as well as the internal surface of the capsular ligament. I am satisfied that the synovia is secreted by those apparently fatty bodies which ancient authors named synovial glands. The principal argument for the synovia being secreted by the whole surface of the joint is, that synovia exists in parts, as in the sheaths of tendons, where no such gland has been observed. This is the case with the sheath of the flexor tendons, which, when distended with synovia, form what are termed wind-galls; and it never has been discovered from what source this synovia is derived. I am of opinion, however, that this synovia is derived from that vascular fatty substance found under the skin of the fetlock joint. A consideration of the synovial glands is materially concerned with the present subject, that is, spavin; for the very worst kind of spavin is that which arises from a complete obliteration of the synovial gland, which supplies the hock joint. This gland, as I have before observed, is situated at the posterior part of the lower end of the tibia. By violent and long-conti-

nued exertion of the hock joint, so great is the consumption of synovia, in consequence of its peculiarly extensive motion, that the synovial gland becomes at length incapable of supplying any more, and in this exhausted state becomes itself the subject of friction. The joint then becomes inflamed and ulcerated, and ossification takes place, by which it is totally obliterated. This kind of spavin is known not only by the severe lameness it occasions, but also by the swelling being about the centre of the joint, or rather higher. Firing and blistering should never be permitted in this disease; it is a needless cruelty as well as expense.

Another kind of bone spavin, and by far the most common, consists in an ossific union of the small bones of the hock, whereby that small degree of motion which they have is rendered painful. This kind of spavin is never productive of much lameness. It is known by a small hard swelling on the lower part of the inside of the hock, and a sudden drawing up or flexion of the joint, especially in trotting. It sometimes happens without any visible swelling, and is then generally named string-halt. But in this case also there has been an ossific deposit, but on the inside of the small bones, and therefore out of sight. The usual remedy for this disease is firing, applying the iron more freely

or deeply than is commonly done immediately upon the swollen part. Some farriers employ caustic, and even arsenic, which they introduce by first making an opening, by boring with a hot iron, or otherwise, into the bony swelling, and into a small hole thus made they introduce some of their caustic.

I was once consulted in a case of this kind, in which the farrier had employed arsenic. It produced a dangerous sloughing, and the horse was nearly destroyed by it. I have been lately informed that Mr. Sewel, of the Veterinary College, employs setons in bone spavin. I have never seen their effect in this disease, and perhaps never shall, as I am satisfied that firing, when any good can be done, is the best remedy. It is a common practice to turn up the outside heel of the hind shoe, and leave the other quite flat, so that the outside heel is nearly an inch higher than the inner. This does great injury when there is a spavin, and certainly contributes to the production of the disorder. In draught horses, and sometimes in others, there is really occasion for turning up the heels of the hind shoes; but the inside heel should have its angles filed off, as horses are apt to step upon the other foot, and wound themselves, and when those angles are left, may do themselves a serious injury.

Horses are seldom cured of this disease unless they are attended to early, and the cause removed by which it was produced, and that most commonly is breaking and riding at too early an age, especially for military purposes, or for hunting; or else it is overweighting a horse, as it is termed. But as common a cause as any, especially when combined with one or both of the others, is turning up the outer heel of the hind shoe, and leaving the inner heel on a level with the other parts. Many other circumstances may concur in producing the disease; but those I have named are the principal causes, and should be carefully avoided.

CHAPTER XV.

BOG SPAVIN.

Bog spavin is a disease very common among young horses, and occurs chiefly at the time of breaking: it is of course more likely to happen when they are broke at too early an age. The hock, it has been before observed, is an important joint, and designed for very extensive motion; but the motion which takes place in a state of nature in this joint, or during reasonable labour of any kind, is very different from that

which is produced in throwing the animal upon his haunches, as it is called, in pulling him up from a gallop suddenly with a powerful bit, or in taking high or wide leaps. These violent motions of this joint in particular are, it may well be supposed, likely to produce this disorder. Bog spavin then is a distension of the capsular ligament, by an accumulation of synovia, which is formed in consequence of the violent exertions I have just described, appearing in a swelling on the inside, towards the bend of the hock. This capsular ligament is very strong and capacious, and can bear considerable distension; and when the synovia has accumulated in a certain degree, it forces out the capsular ligament on the outside of the hock, forming a tumour between the os calcis and the lower end of the tibia: these two swellings considered together form what is commonly termed a *thorough pin.* I have been informed that it is a common practice in Ireland to open the bog spavin when it becomes so large as to impede the motion of the joint. This has been considered a very dangerous operation, from the circumstance of dreadful inflammation having followed the accidental opening of this part, especially when it has been done by a pitchfork. But since I have found that wind-galls may be opened with safety, and perceived that there is a

striking analogy between the structure of these two parts, I have been led to reflect upon the circumstance, and am now of opinion that bog spavin, when so large as to cause lameness, and prevent the horse from working, may be opened with safety, and this may be considered indeed the only remedy. Firing and blistering have been tried innumerable times, but never, as far as I know, have they done any good. It must not be supposed however, that bog spavins are to be opened, unless they occasion lameness and inability to work. Most commonly they are not productive of inconvenience; and therefore nothing should be done, unless it is using the horse moderately, and avoiding those causes which produced the complaint. I have said above, that there is a striking analogy between this part and that connected with wind-gall; it consists in this,—the distended capsule, in both cases, communicates both with the joint and with the tendon. This peculiarity in the structure of the hock and fetlock joint has never been described by those who have written on Veterinary Anatomy, nor has it been noticed by Mr. Coleman in his lectures.

With regard to the source of the synovia in these joints we cannot perhaps speak with any degree of certainty, nor is it very important that we should do so; but we know how essential this

fluid is to the perfect motion of joints, and that when it becomes abundant, from excessive exertion, so as to form tumours, the parts that supply it, as well as those which confine it, will be the sooner worn out. When we consider the use of synovia, and the cause of those accumulations of the fluid, which are named wind-galls, bog-spavin, and thorough-pin, and which often form tumours about the tendo achillis, or great tendon of the hock, we shall perceive that the only benefit to be expected from letting it out, by making a small puncture in the tumour, and pressing out the fluid, is the removal of the swelling; and even in this we shall be disappointed, unless the puncture is touched immediately after with the actual cautery, or a bit of lunar caustic. I have found the latter answer the purpose when wind-galls have been opened; and in several cases where the sheath of the flexor tendon had been accidentally punctured, and synovia has escaped from the wound, I have completely succeeded with it, even when there was considerable inflammation and swelling, for which fomentations and poultices had been carefully, but ineffectually, employed. It has been necessary in some cases to apply the caustic a second time.

CHAPTER XVI.

CURB.

THIS is a swelling in the back and lower part of the hock, extending from five to eight inches; the centre of the swelling being about eight inches from the point of the os calcis. The curb is, in its nature, similar to a strain in the back sinews, and depends upon the rupture, and consequent inflammation, of some vascular membranes, situated between the two tendons of the gastrocnemii muscles. But the same remedies is not applicable here. Firing and blistering are the only effectual and permanent remedy I am acquainted with. Blistering alone will always remove thelameness; but, according to my experience, the permanency of the cure cannot be depended upon, unless the horse is employed afterwards in very moderate work only.

CHAPTER XVII.

ON LAMENESS, FROM AN AFFECTION OF THE LAMINATED SUBSTANCE, ELASTIC PROCESSES, OR ELASTIC MEMBRANES, WHICH UNITE THE SENSIBLE FOOT WITH THE HOOF.

This affection consists in a slow kind of inflammation, by which these parts are rendered morbidly irritable and tender, so much so, that the horse often feels much pain by throwing his weight upon them in walking, but more especially in trotting. Sometimes they are so exceedingly painful, that the horse is scarcely able to stand; but this is always a consequence of founder, as described in a former place. This affection of the membranes is often fluctuating. Sometimes there is a torpor in the vessels of the part, a deficiency of blood, and a consequent coldness in the foot; at others, and more frequently, there is a morbid degree of heat. These elastic membranes are most curiously constructed, and form an immense surface for the secretion of horn. The blood sent to them for this purpose is more abundant than can well be imagined, and furnished in a very peculiar manner. Two large arteries pass into the posterior part of the coffin-bone, and divide into

branches which pass out all around the lower circumference of the bone.

This wonderful provision for protecting the principal trunk of the artery, and for furnishing such an abundant supply of horn at a part where it is particularly wanted, affords another wonderful instance of the goodness of the Almighty, in providing not only for the wants of the animal, but also for the uses of man; for without this abundant supply of horn at this particular part, the animal would not be adequate to the services he now performs.

Other considerable arteries supply the frog, the sole, and the other parts. It is worthy of remark, that the upper part of the hoof is supplied by different arteries from those which supply the lower part; the former pass under the coronary ligament, and spread into innumerable branches. There is also a complete net-work of veins for returning this blood, more perhaps than may appear necessary: but it is for the purpose of preventing obstruction in the arteries, and consequent inflammation. The veins pass up in numerous branches over the lateral cartilages, converging towards their trunk, which passes up the pastern one on each side of the flexor tendon.

That the horse is designed for the use of man is apparent from numerous circumstances, both

in his structure and economy; but in no part is it so conspicuous as in the foot. For if the animal is kept idle in the stable, he will often contract lameness in the foot merely from that circumstance; and if a horse is turned to grass so lame that he is unable to exercise himself, the hoof will grow to such an extent, there being no wear, and the toe become so long, that he will be thrown back upon the heel, so as to strain the back sinews. I have known one horse that absolutely broke down in this way, came down upon his fetlock joints, and by the constant pressure the tendon received at this part, it was partially changed into bone.

From the short view I have taken of the economy of the foot, the importance of the elastic membranes may in some measure be appreciated. As they are so largely supplied with blood vessels, it may be easily supposed that they have a proportionate supply of nerve. This is the case with the membranes of the superior parts of the foot, and when they are compressed it may be known by their exquisite sensibility. From this circumstance, it will be seen that the nails in shoeing should never be driven high up in the hoof; and though this is considered by many English smiths as a point of excellence in shoeing, it is really the chief point in which they err. The French in this respect, and this only, certainly excel the English.

In the section on Founder of the Feet, I have noticed the dreadful diseases that are often produced in the elastic membranes, by the cruel and immoderate exertions in which the animal is frequently employed. Those now under consideration are of a subordinate kind, and sometimes occasioned merely by standing idle in the stable, more commonly, however, by hard trotting, neglect of paring the feet, standing upon litter, &c. Still they are of a serious nature, and often incurable. The treatment, however, is simple, and consists in removing superfluous horn from the hoof and sole, with the rasp and the drawing knife, wrapping the whole foot and pastern in an emollient poultice, and after a few days, or a week, turning the horse to grass. Blisters should never be employed. Bleeding and a dose of physic are useful on the first occurrence of the lameness; but this period is not often observed; most commonly it comes on slowly, and almost imperceptibly, and the horse is often continued in work until the disease is rendered incurable.

CHAPTER XVIII.

THRUSH.

THIS is a disease of the frog, causing a dis charge of matter from its division or cleft, not often productive of lameness, especially in the hind feet, where it is always a consequence of negligence in the groom, in permitting a horse to stand in his dung, or upon foul wet litter. This softens and rots the horny frog, the putrid and acrid fluids penetrate through the soaked and rotten horn, and inflame the sensible frog, causing it to discharge a fetid acrimonious matter, instead of secreting horn for its own defence, as it does in the healthy state.

Thrushes in the fore-feet are sometimes occasioned by contraction of the heels, but more frequently by the horny box or hoof, considered all together, becoming too thick, and consequently inelastic. In this case, the blood is principally distributed to the sensible frog; the arteries that supply this not being liable to compression, being lodged in that elastic substance of fatty membrane and cartilage, of which the body of the sensible frog is composed. This Lafosse supposes to be destitute of nerves, and

that its covering or skin only is endued with sensibility. I believe this opinion is correct; for in this part sensibility is not only unnecessary, but would be injurious. This part forms a very curious spring, and is constructed in a manner that is truly wonderful. It is composed of fatty matter and cartilage, which are so distributed, that the more the frog is compressed, the nearer the cartilages approach each other; thus the frog becomes denser and denser, while its elasticity increases in a similar ratio. When it is compressed to the greatest degree, the effect is imparted to the lateral cartilages, and these bodies impart it to the heels, and quarters or sides of the hoof, and thus it is that the motions of the hoof are produced. To admit of this motion of the hoof, which is the only one that takes place, the elastic membranes yield in a very slight degree, which diminishes from the heel to the toe, but is sufficient for the economy of the foot. The treatment of thrush must depend altogether upon the cause which produces it. When in the hind foot, and occasioned by filthiness, the cause must be removed, and then the disorder may cease; but this is not always the case, for the thrush sometimes has proceeded so far as to produce ulceration of the sensible frog, which then requires to be dressed with a solution of blue vitriol, or oxymel of verdigris.

Before this is done, the cleft of the frog should be thoroughly cleansed to the bottom by means of tow; and if there is any ragged horn covering a diseased part, it should be completely removed. One of these dressings, when it is properly done, is sufficient for the cure. Some tar, or hoof ointment, such as has been prescribed in the chapter on contracted heels, may be applied hot, to promote the regeneration of horn, and to defend it from moisture. In cases where the frog has become very tender or rotten, I have found it necessary to apply a mixture of tar and sulphuric acid, which is made by adding one ounce, by weight, of sulphuric acid to one pound of melted tar, and stirring the mixture for some time. As to the thrush in the fore feet, the treatment is different. Here also the cause must be first removed, which is, an undue determination of blood to the frog, in consequence of the compression the sensible foot suffers from a contraction of the heels; or from a superabundance of horny matter generally in the crust, and often in the sole also. The motion which I have described as constantly going on in the hoof, will now appear to be an essential provision in that part: for the heels, as they contract, become deficient in, and at length totally lose, their elasticity. When the frog, under this circumstance, comes down upon the

ground and receives pressure, the pain the animal feels from the ineffectual attempt thus made to expand the inelastic and inflexible heels causes him to lift the frog a little, and go principally on the toe; hence the stumbling and falling, so common in this case. This kind of thrush then is to be considered rather as useful than otherwise; and by attempting to stop it by those preparations which are usually employed, the lameness is often increased. The only thing to be done is to rasp the heels and quarters, thin the soles, cover the frog with tar ointment, and wrap the foot in an emollient poultice; in slight cases, complete and permanent relief will be thus afforded. Should the thrush continue after the hoof has been well soaked with the poultice, and especially if the frog is very tender and rotten, apply the mixture of tar and sulphuric acid. Ægyptiacum, either alone or with a small portion (a few drops to two ounces) of sulphuric acid, has been recommended. In old thrushes, physic may be useful, and some alterative medicine. Sometimes a run at grass is necessary in moist ground, and a horse may often be worked while he is thus kept. In bad cases, palliation only can be expected, unless a new hoof be obtained of a better kind, by rasping the quarters and thinning the sole, until spots of blood appear;

and then, after stopping the feet with tar ointment, turning the horse to grass.

Thrushes may happen in the fore feet merely from filthiness, and may then be cured as they are in the hind feet; but this is not a common occurrence.

The third kind of thrush I have to describe is not so common as the two former, and is no other than incipient canker. It may always be cured by removing from the frog every bit of horn that is detached from the sensible frog, and by which a diseased part may be concealed, and then applying to the affected part a saturated solution of blue vitriol, or ægyptiacum, with a few drops of sulphuric acid. Cleanliness must be carefully attended to; and when the disease of the frog has been cured, tar, or hoof ointment, may be employed to promote the regeneration of horn.

CHAPTER XIX.

CANKER.

This is an obstinate, and often incurable, disorder of the foot, generally beginning in the frog, and spreading from thence to the other parts; even to the coffin bone. It is often a consequence of neglected thrush, but sometimes comes on without any apparent cause, and most commonly in one or two feet, but sometimes it attacks both the fore and hind feet at the same time. I have now two cases under my care. In one, the near fore foot is principally affected; the off fore and near hind foot slightly.

The first animal is a fine saddle horse, and the disorder seems to proceed from the horse standing idle in the stable upon litter, and upon good keep. The latter is a waggon horse that has been worked rather hard, and kept upon oats, chaff, and beans, with a small portion of grains, and as much hay as he likes to eat. The saddle horse is nearly cured. The waggon horse appears better; still I fear that the disease in him will prove incurable. One thing is essential in the cure, and that is to remove carefully every bit of horn by which a diseased part may be con-

cealed: this must be done at every examination, and the foot must be carefully examined and carefully dressed every day. The treatment of canker and the probability of success, depend upon the length of time it has been standing. When taken in hand at an early period, and before it has extended beyond the frog, a daily dressing of a strong solution of blue vitriol, and a stopping of melted tar ointment, or the mixture of tar and sulphuric acid (one ounce of acid to one pound of tar), may be sufficient to effect a cure. Should this fail of bringing on a healthy appearance, let some butter of antimony be applied, or add to two ounces of the solution of blue vitriol ten drops of sulphuric acid. A solution of blue vitriol in vinegar may be tried. Whatever caustic may be found necessary for the cure of canker, some preparation of tar is useful in promoting the reproduction of horn: pressure on the diseased parts is conducive to the cure, and may be applied by means of tow dipped in the melted tar ointment, or tar and sulphuric acid, and kept in by tranverse slips of wood, or splints as they are termed, confined under the shoe. It would be difficult to enumerate all the remedies or means that have been employed for the cure of canker, and most commonly without success: for the disease after some time appears to penetrate to the ligaments,

cartilages, and bones; and those who have been most successful have been in general most free in the use of the drawing knife and caustic. In two bad cases that I have seen *cured*, after a considerable time, and much labour, the horses were afterwards irremediably lame. Mr. Leigh, Veterinary Surgeon of Bristol, had a carriage horse under his care with a canker in the hind foot. After a little time the horse became so troublesome that it was found almost impossible to dress him, and pare out the foot properly. He therefore, threw him down and performed the nerve operation upon the leg; after which the foot was dressed without resistance, and the canker soon got well. When I heard of this case, the horse had been in work four years after the operation. The only caustic I have not seen tried in canker is arsenic, or some preparation of that poisonous mineral: I have known it applied with success in fistula of the withers and poll-evil, also for the removal of warts, still I should be afraid to apply it in canker, as its destructive influence cannot be limited. I have seen the actual cautery applied, and, I think, with good effect; also oil of vitriol, nitrous acid, corrosive sublimate, quicklime, tar and sulphuric acid nearly boiling hot, quicksilver, or red precipitate, dissolved in nitrous acid, and many other caustic prepara-

tions. A mixture of corrosive sublimate, blue vitriol, and prepared chalk, has done good; also a solution of sublimate in tincture of myrrh, or spirit of wine. At every time of dressing, the spungy surface should be scraped off; and, if any horn remain of the sole and bars, it should be carefully examined in order to discover whether the disease is creeping under it or not; if there is even a suspicion of its being so, the horn must be completely removed, and the diseased part dressed. If, upon a careful examination with a probe, the coffin bone be found carious, it must be freely scraped with a drawing knife, and whatever part there may be in the way so as to impede this operation, it must be removed. Sometimes the disease spreads under the wall or crust, and then generally affects the coffin bone. In this direction also it must be scrupulously followed with the drawing knife. It often happens after a great deal of time and labour has been bestowed on this disease, that the practitioner is unexpectedly defeated by suffering the disease to creep gradually under the horn of the bars, sole, or crust. In the case I have now under my care, in which all four feet are cankerous, I have told the farrier who attends, that unless he dresses the feet daily, and observes carefully the directions I have given with regard to

paring the feet previously to every dressing, whatever time it may require, his labour will certainly be in vain, and he may as well do nothing.*

It is not unlikely that canker, when of long standing, is, in some degree, a constitutional disease; and, in this case, it may be useful to turn the horse into a dry field or paddock, or, at all events, to keep him on green food. Rowels in the thighs and chest may also be useful.

* This horse is now sufficiently recovered to return to his work.

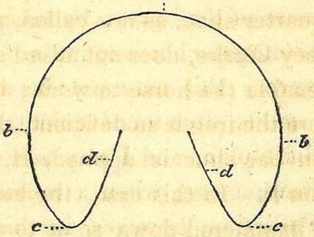
CHAPTER XX.

CORNS.

THIS is a disease of the sensible sole, sometimes extending to the bone which covers it. It is caused by the pressure of the shoe on that part of the sole which lies between the bar and the crust, and most commonly in that angle or corner where they unite to form the heel of the hoof. The sensible sole is so bruised, that the blood vessels are ruptured, and the effused blood mixing with horny matter, is the cause of the red appearance by which the disease is distinguished. The only thing to be done is to remove the cause of the injury, by taking off the shoe, and turning the horse to grass. In slight cases, however, this may not be absolutely necessary, and is often inconvenient; but it is by far the best plan, and I may add, perhaps, the only effectual one, when a radical cure is desired. Palliation, however, in this case, is the thing generally sought after, for proprietors prefer riding a horse that is a little tender, as they term it, and run the risk of breaking the animal's knees, and their own necks, to turning him out, and losing the use of him for a month

or two: and besides, the mode of cure I have recommended may appear too simple and easy. Some paring may be thought necessary, for a corn is considered as a diseased part that ought to be cut out. When, therefore, a horse cannot be sent to grass, and the disease is so slight as not to produce lameness, let the affected heel, crust as well as sole, be rasped or cut down with a drawing knife, so that when a bar shoe is applied, there may be no pressure on the affected heel, or about an inch beyond it, that is, towards the toe.

The annexed diagram will serve to explain on what part of the hoof the shoe should bear. *a* represents the toe; *b b*, the quarters; *c c*, the heels; *d d*, the bars. The space between



the bars and the circular line is occupied by the sole, and that between the two bars by the frog. In the usual way of shoeing, the shoe is made to bear uniformly all around the circumference, or bottom of the crust, the heel of the shoe

terminating where the heel of the crust does, at letter *c*. Now in corn, which generally happens in one heel only, and that the inside, the shoe must have no bearing on the part between *b* and *c*. To effect this, so much of the horn must be removed from this part of the bottom of the foot, that is, from *c* to *b*, as will leave a space between the shoe and that part, of a quarter of an inch.. The practice commonly is to scoop out the reddened sole or corn between the bar and crust, and leave these to receive the bearing of the shoe; but this will not do; the crust also must be removed, as well as the bar, to the depth of a quarter of an inch. The shoe will not be rendered unsteady, or liable to come off, by doing this; the bearing the bar shoe has on the frog, will be sufficient to keep it steady. The three-quarter shoe, as it is called, proposed by Mr. Bracey Clarke, does not afford sufficient support to enable the horse to work; but there are feet where the frog is so deficient, that when the common bar shoe is applied, it will have no bearing on it. In this case, the heel of the bar shoe is hammered down so as to meet the frog; but this seldom answers, as the frog is generally too tender to bear the pressure of it: this, indeed, is sometimes the case when the frog is sound and prominent, and especially when the heels are inelastic and inflexible. In

this case, the only thing to be done is to take the common shoe, such as the horse usually wears, and cut off about one inch from the heel, or just as much as will leave the tender part of the heel uncovered; this, however, must still be pared or rasped away in the manner I have described. But the bar shoe is the best method, when the frog is capable of bearing its pressure. Caustics, and even the hot iron, have sometimes been applied to corns; they may have had the effect of deadening the feeling of the part for a short time, but they often do great mischief, and should never be employed or permitted, in any case of corn whatever. Tar ointment, Friar's balsam, or solution of blue vitriol, have also been used; they may be innocent, but certainly are not necessary. When corns are not attended to, severe lameness is often the consequence. Smiths frequently do nothing more than scoop out the corn, and apply a common shoe. This sometimes relieves the horse for a short time; but he soon becomes lame again, and generally lamer than at first: it is in this way that corns are rendered so troublesome, and productive of so much inconvenience. Inflammation and suppuration is thus sometimes induced in the heel, and the matter breaks out at the coronet. In this case, the whole of the affected heel must be entirely removed, even

the crust of the heel and the bar; and when the part has been well soaked out with a poultice, that is, after a few days, it may be dressed with tar ointment, and about a week after it has been thus dressed, the horse should be turned to grass *without shoes.*

CHAPTER XXI.

SAND CRACK.

This is a crack, or longitudinal fissure, in the side or quarter of the hoof; generally on the inside, and almost always in the fore feet. We sometimes meet with cracks in the front of the hind feet, generally in draft horses; and these, as well as the former, often occasion lameness. Sand crack seems to depend on a brittle state of the hoof, and, in such hoofs, is readily produced by violent exertion, or by blows; aud may happen also while the horse is at rest, when the hoof is very dry, hot, and brittle. Whenever a horse's feet, therefore, are found in this state, the following means should be immediately resorted to for improving them, as we may thereby prevent a sand crack; and this will be found, as it is in all other cases, much easier and cheaper than the cure of the disease. Let the shoes be taken off, and the soles pared rather thin and smooth with the flat part of the drawing knife, and not by drawing or scoring it out with the bent part, as is sometimes done. When this has been done, let the shoes be put on again, and the feet well

stopped with a mixture of tar and tallow, melted, and poured upon the foot warm; some tow is then to be laid on, first dipped in the melted tar and tallow, and confined by means of two transverse slips of wood crossing each other, the ends being brought under the shoe. The rest of the foot should be kept moist by tying wet rags round the pastern, or the horse may be turned into a paddock or orchard, if the weather be favourable. A hot, dry, and feverish state of the fore feet is sometimes, in a certain degree, constitutional: and if it may not be strictly considered in this light, it will surely be admitted that the predisposition or tendency to this state is so, and that it is often hereditary. Hard trotting upon hard roads, or hard riding of any kind, standing upon litter, hot stables, and high feeding, may be considered as the exciting causes, especially hard riding; and this even in horses of strong constitutions, where no such predisposition exists, will often bring on a feverish state, or morbid degree of heat, in the feet, and consequently contraction and all its train of evils, among which is the subject of the present chapter. When a horse is found to have this morbid heat and dryness in the feet, and it is not convenient to turn him out as I have advised, a dose of mild physic should be given; and, after its operation, a cooling diet

should be persisted in, in addition to the local remedies before prescribed, until the feet become cool. When a sand crack has taken place, it should be immediately pared out with a small drawing knife, so that no hollow part may be left to harbour dirt or gravel; we shall then come to the soft horney matter which immediately covers the elastic membranes, or processes. Having done this, the whole quarter, as well as the coronet, is to be covered with a pledget of tow dipped in melted tar ointment, which may be confined with a bandage; or all the parts may be well smeared with this ointment; and, if it be rubbed also on the skin above the crack, it will promote the growth of horn. When a sand crack is not observed at this early stage, but the horse is ridden with it, there is generally considerable lameness, and an oozing of blood from the crack, in consequence of the sensible parts, or elastic membranes, being pinched and compressed between the edges of the fractured horn. This may be called the second stage of sand crack, and requires to be drawn out in the same manner as the former, taking great care that no edges of horn are left to pinch the sensible or fleshyparts as they are termed. In this stage of sand crack, I am inclined to think (for I have lately succeeded in several cases by the treatment) that it is the

best plan to apply the hot iron, first in the direction of the crack, so as to sear the part lightly, and afterwards transversely at the head of the crack to prevent its spreading upwards into the coronary band; often, however, the crack extends into this band, so that there is no space left to make a transverse line; in this case the upper part of the crack must be touched very lightly with the edge of the firing iron, and we must omit the transverse line until the new shoot of horn has grown down sufficiently from the coronet to admit of it. Having done this, we must apply the tar ointment, and keep the hoof moist as before directed. When the shoe is put on again, the heel and quarter should be so lowered that they may receive no pressure or bearing from the shoe, or the horse may go without shoes. (See *Corns*.)

The sand crack in the front of the hind-foot is to be treated like that in the heel or quarter of the fore-feet; and, when it occasions lameness, a little blistering ointment may be rubbed on the skin above the crack. Sand crack some times happens in consequence of a wound or bruise on the coronet, or rather in consequence of such a wound or bruise being neglected. In this case, the same principle is to be kept in view; that is, to encourage a new shoot of sound horn at the coronet, which will carry the

broken part before it, and, as the hoof grows down, it will descend, and at length disappear. Sand cracks most commonly happen in dry summer weather; and, I think they often occur in very dry cold weather. Professor Girard, in his Traité du Pied, observes that horses that travel much, especially in summer, are very liable to sand crack; and adds that several veterinary surgeons, who were with the French army in Egypt, assured him that nearly all the horses transported from France into Egypt had the sides of the hoof in a dry cracking state (fendillés), and were continually having sand cracks.

CHAPTER XXII.

QUITTER.

THIS is a disease of the foot, originating in a bruise or tread upon the coronet, or thin parts of the hoof. Superficial injuries on the coronet are often inflicted by the horse scratching himself with the opposite heel. But the bruise which causes quitter is of a more serious nature, and is inflicted by the horse stepping with great force upon the higher part of the inside of the foot in endeavouring to save himself from slipping; and from this it is that the disorder generally or almost always takes place in winter, when the roads are slippery. It is well known that smiths, and the most ignorant of farriers, often succeed in the treatment of this disorder, and that veterinary surgeons often fail. The cause is, that they are not sufficiently attentive to such cases, and do not follow up the dressing as it is necessary to do, in order to get at the bottom of the injury. In order to cure a quitter effectually, let the following directions be carefully attended to.

Ascertain carefully by means of a probe, the direction and extent of the sinuses, or pipes, as

they are termed, then let them be completely filled with sublimate.

To do this effectually, the sublimate must be wrapped up in small pieces of whity-brown paper, and introduced by very small portions at a time, so that they may be forced, as near as possible, to the bottom of the sinus. But however carefully this may be done, the sinuses are always so crooked or winding, that the first dressing can seldom be got to the bottom of them. In six or seven days a large slough or core will come out, when the dressing has been properly applied; and as soon as this has taken place, it may be necessary to dress in the same manner as at first; and even this must be repeated if the bottom of the disease is not found, and that generally is the lateral cartilage. Nothing more is necessary after this than to keep the sinus filled with lint, dipped in Friar's-balsam, taking care to introduce it quite to the bottom every time of dressing. The sinus wil thus be gradually filled up and healed. Quitters are sometimes cured by syringing the part, after it has been cored out with sublimate. For this purpose a tube is forced into the wound, so as to reach the bottom, and through it a strong solution of blue vitriol, or tincture of myrrh, injected. When these means fail, the foul cartilage, or bone, may be scraped by a very small

chisel or gouge, or other more convenient instrument. I have seen quitters cured, or rather dried up, merely by dressing with tincture of myrrh, after coring it out with sublimate. The opening has often remained, and appeared to have become horny within, so that no inconvenience was felt from it. Another method of curing quitter is one commonly practised by farriers or shoeing smiths, and is called boring. This is done by passing a red-hot iron, of a suitable size and form, to the bottom of the sinus, and then filling it with sublimate, or strong sublimate ointment. Sometimes another opening is made through the sound parts, at a little distance from the quitter, but in a slanting direction, so as to communicate with the quitter: this also is filled with sublimate ointment.

When much pain and swelling take place after the operation, the foot may be wrapped in a large poultice. After the cure of a bad quitter there is often a permanent defect on that side of the hoof, which is named a false quarter; that is, the new shoot of horn that grows down is imperfect, depressed, of a light colour, and is apt to split, and become a sand crack. When a horse receives a wound or bruise on the foot or coronet, by treading upon it, or by other means, the most likely method of preventing a quitter is to bathe the wound or bruise with a

strong stimulant, such as tincture of myrrh, Friar's-balsam, spirit of turpentine, or camphorated spirit. This seems to deaden the sensibility of the bruised or wounded nerves, and thereby prevent inflammation more effectually than a poultice. Should inflammation take place, however, afterwards, a poultice should be applied.

CHAPTER XXIII.

WIND-GALLS.

This is a disease that has been alluded to more than once in the foregoing pages, and is so well known that a description is unnecessary. They are supposed to consist of distended bursæ mucosæ, names given by Dr. Munro to certain parts about tendons and joints of the human body that I never could discover in the horse. However this may be, wind-galls are a distension of the perforatus tendon, that is, the sheath of the perforans tendon, and are a consequence of excessive use of the fetlock joint. This joint, as I have before observed, is one of great importance, and, considered in its oblique position, will be found to support the weight of the whole body, by means of very strong ligaments, as I have described in the section on Strains of the Back Sinews, p. 182.

There is another disease of this joint, which has never yet been described, and is caused by the excessive pressure which it is occasionally made to sustain. In consequence of which, the cartilage of the joint is worn out in certain parts of the inside sesamoid bone, and

the corresponding condyle of the metacarpal bone, which causes the horse to stand upright in his pasterns, to avoid, as much as possible, pressure on the sesamoids. This, it must be obvious, could not happen if the pastern and metacarpal bone preserved their respective positions, as the pressure then would be so equally distributed, that the whole cartilage would wear equally. It is done, therefore, by putting such excessive weight on the animal as he was not intended by his Maker to bear.

Wind-galls do not occasion so much inconvenience as this last disorder, which renders a horse very unsafe to ride, and fit for little in harness work; he should therefore be turned to grass without shoes, taking care that the toes are not suffered to grow too long, which would increase the obliquity of the pastern; and this sometimes produces the injury I have been describing. Wind-galls may be produced in a similar manner. These are evils sometimes resulting from the use of tips, as well as the thin-heeled shoe. Wind-galls are a deformity, and sometimes a considerable one, and they may produce lameness. Unless, however, they are considerable, and productive of lameness, nothing should be done for them; but when large, and a cause of lameness, they may be punctured with a small lancet, and the fluid pressed out, while

the orifice is kept open with a probe. When this has been done, the orifice should be touched with a bit of lunar caustic, which should be a little rounded or pointed at one end for the purpose. This causes it to heal quickly, a matter of great importance, as by keeping it open, or treating it otherwise, a violent and serious inflammation would be the consequence. Having accomplished this, a charge or adhesive plaster may be applied, or the horse may be blistered or fired, and afterwards turned out in a paddock or orchard where he cannot take too much exercise. Some writers have described a method of cutting out wind-galls, a thing that never could have deen done, and others have a process for sloughing them out. This may be done, and the horse may so far recover as even to gallop again; but the intolerable pain that is thereby produced, and the great risk that is run of destroying the animal, by bringing on locked jaw, without the slightest chance of permanent advantage, should deter people in future from attempting it, or permitting it to be attempted. In puncturing wind-galls in the manner I have described, there is no pain given to the animal, nor is it followed by inflammation, when closed by caustic immediately after. But the wind-galls will not be cured, for as soon as the horse returns to that work which produced them, they will

again fill like other dropsical cavities. But if a horse is fired and blistered, and allowed a run at grass, the skin will become thicker and tighter about the joint, and thereby strengthen the part, and the horse will be so far restored, as to be fit for as much labour as any horse ought to perform.

CHAP. XXIV.

ON LAMENESS FROM WOUNDS OF THE FOOT.

These accidents most commonly arise from the carelessness of the smith in nailing the shoe to the hoof. The nail is either driven so as to wound the sensible parts, or so near them, as to occasion, by its pressure, pain, inflammation, and in a few days, suppuration, or the formation of matter.

When a nail is driven so close as to wound the sensible parts, the animal suddenly draws back his foot, from the pain he suffers; and the smith aware of what he has done, removes the nail, and takes no further notice of it; though, sometimes, to avoid suspicion, he fills the vacant hole in the shoe with the head of a nail; and when the horse is afterwards found to be lame, he too often denies having any knowledge of the cause. When the horse is not worked immediately and the wound not considerable, it may not occasion lameness; most commonly, however, it is of a more serious nature, causing violent inflammation, which terminates, in a few days, in suppuration. The matter which is formed, being confined, spreads under the

horny sole, and causes so much pain that the horse can scarcely put his foot to the ground, and if he be not relieved, by giving vent to the matter, it continues to spread; and ultimately breaks out at the coronet, or top of the hoof. When the disease has been suffered to proceed thus far, it is difficult to cure, and often leaves a permanent tenderness of the part.

As soon as it is known that a horse has been pricked, as it is termed, in shoeing, if the smith were to remove the horn, where the nail entered with a small drawing knife, so as to allow the matter which may form to escape freely, all this mischief might be avoided. It would be proper to let the horse stand without a shoe for a few days, and wrap up the foot in a large bran poultice. It is a common practice with smiths, on these occasions, to pour oil of turpentine into the wound; and, sometimes, in order to increase its power, they set it on fire; after this the shoe is put on, and the bottom of the foot filled up with tow dipped in hot mixture of lard and turpentine. In trifling wounds of the foot, the horse often gets well under this treatment though more slowly, perhaps, than he would had these remedies been omitted. It may be proper, however, to pour a little Friar's-balsam into the wound, which forms a sort of coating, and may serve to exclude air and moisture from

it, and thereby prevent the formation of matter: with the same view, the cavity that has been made by removing the horn may be lightly filled with tow dipped in digestive ointment. But in wounds of a more serious nature there is generally a high degree of inflammation, so considerable sometimes as to excite fever; and, in a few instances, it has been followed even by locked jaw. All stimulants should here be avoided, until the inflammation has subsided, and matter is formed, which invariably happens in wounds of this description.

The first thing to be done in these cases is to enlarge the opening made by the nail, and pare away the horny sole, on the same side, until it yields to the pressure of the thumb; a large poultice is then to be applied. After two or three days matter will have been formed; and upon pressing the sole, near the wound, a little dark-coloured fluid will be seen issuing from it. On introducing a probe into the wound, it will be found to pass under the horny sole, sometimes to a considerable extent; and as far as the horny and sensible sole are separated, so far is the former to be removed. A dressing of tar ointment is then to be applied; by means of which a new horny sole will be gradually produced. Should the matter have penetrated to the coronet, the same operation and treatment are

necessary, excepting the poultice: for, when the disease has proceeded thus far, we may be sure that there is matter confined under the horny sole. The sore or opening on the coronet is to be dressed with solution of blue vitriol or tincture of myrrh. After being dressed for three or four days with either of these preparations, Friar's balsam and a plaster of digestive ointment may be used. When the nail has been driven so near the sensible parts as to cause pain by its pressure, inflammation comes on slowly and gradually: and sometimes the lameness does not appear until several days after the shoe has been applied. This may more properly be termed a bruise of the sensible parts of the foot, than a wound; but it produces the same effects, which are inflammation and suppuration. This kind of lameness comes on gradually; and is often so inconsiderable at first, that it is not observed by a careless rider. When the smith is consulted on these occasions, he seldom discovers the seat of the lameness, (unless it be after matter has been formed, when the cause is too manifest to escape his notice,) but attributes it to a strain of the shoulder, or a *bit of a wrench* in the fetlock joint. This is more likely to be the case when the smith that shod the horse is applied to; but, if another is consulted, he takes care to search

very diligently for any errors his rival may have committed; and, though he find nothing to account for the lameness, will often affirm that the horse has been *pricked;* he then *stops* up the foot with some greasy substance, and trusts to nature and rest for making good his assertion; for, should the horse recover, he depends on its being attributed to his superior skill and penetration.

Much mischief, however, is often done by their mode of investigation; for they cut away the horn so freely, between the bottom of the crust and the sole, or where the nails are placed, that scarcely any room is left for nailing on a shoe; and it is, perhaps, a considerable time before the horn can be reproduced which has been unnecessarily removed. When a horse has been pricked in shoeing, and the lameness does not go off spontaneously, it must, in a short time, be discovered. The lameness gradually increases; and, when matter is formed, it is very easily detected, by pressing moderately with pincers, or by a slight blow on the part: or, should it escape observation at this period, it cannot fail of being noticed when it breaks out at the coronet. The part of the fore foot most commonly wounded is the inside quarter, from the horn being thinner in that part of the foot than any other; but, in the hind foot, the quar-

ters are generally thicker; and here we most commonly find the wound nearer the toe. When it is suspected that a horse has been wounded or *pricked* in shoeing, the first thing to be done is to strike on the foot gently with a hammer all around the hoof where the nails are clenched, and on the shoe also. The wounded part may thus be generally discovered by the horse suddenly withdrawing his foot when it is struck. The shoe is then to be taken off, and the wounded part opened with a drawing knife, and treated as we have before described; but should no tenderness be observed in the foot, it would still be advisable to take off the shoe, and apply a poultice to the foot; that is, supposing every other part of the limb to have been carefully examined also, and no cause for the lameness discovered. If the lameness should arise from a wound in the foot, it will gradually get worse; and, when matter has been formed, the tenderness is so considerable, that it can scarcely fail of being detected. Sometimes the horny sole, by which the matter is confined, is of considerable thickness; and it sometimes happens that the smith, having pared away as much of the horn as he thinks can be done with safety, is afraid to go any further. But, whenever we find great tenderness, upon pressing the sole with the thumb, or striking it gently, we may be assured there is

matter underneath, and that it ought to be let out, however thick the horn may be which covers it. If there be no matter, it may be known by minute specks of fluid blood appearing on the horn, as we approach the sensible sole. This indicates that no separation has taken place between the sensible and horny sole, and that there is no disease in the part. Supposing this mistake to have been made, which, however, is very unlikely to be the case if the directions we have given are attended to, the part is to be covered with digestive ointment, and defended from pressure, until the horn has grown to its usual thickness.

The horse's foot is often wounded by his stepping on a nail, which, in technical language, is termed *picking up* a nail. The frog is the part generally wounded, and most commonly on one side. When the nail enters at the back or wide part of the frog, that is, towards the heel, there is much less danger than when it enters near its toe, or termination. In the latter situation, the coffin-joint is exposed, and is often wounded, causing obstinate or incurable lameness; and, should the nail not have penetrated so far as to enter the joint, it generally wounds the tendon by which it is covered. The treatment is similar to that we have recommended for wounds in shoeing; that is, opening the wound, paring

away the surrounding horn, and poultices. When the inflammation is considerable, bleeding, bran mashes, and a purgative, are useful. After a few days, it will be found that the horn surrounding the wound has been separated from the sensible parts; when, by pressing gently on it, a little dark-coloured fluid will be observed to ooze from the wound. All the horn that has been thus separated should be carefully removed, however extensive it may be. A dressing of digestive ointment is then to be applied, having previously poured a little Friar's balsam or tincture of myrrh into the wound. If the wound does not appear to get better, but discharges a thin yellow fluid, it should be touched carefully with the nitrate of silver, or lunar caustic, and afterward dressed with Friar's balsam. It sometimes happens, however, when the nail has penetrated through the tendon, and injured the coffin joint, that the disease gradually increases, and at length becomes so bad, and so hopeless a case, that it is deemed necessary to destroy the animal. I have seen butter of antimony applied with success to a wound of this kind, a few hours after it happened, and am inclined to believe that in all wounds of tendinous or ligamentous parts a caustic is the best application. I prefer lunar caustic, or nitrate of silver, but in some situations a fluid

caustic, such as butter of antimony, or muriate of antimony, may be better. If these wounds are not immediately attended to, and properly treated, a serious and obstinate lameness is often the consequence.

CHAPTER XXV.

ON LAMENESS FROM BRUISES OF THE FOOT, BY STONES, GRAVEL, &c.

Cases of this kind are by no means uncommon, and are generally caused by the pressure of the shoe, particularly in horses with thin flat soles. Horses, also, with good soles, are occasionally lame from this cause, through the injudicious management of the smith, who, being generally ambitious of improving the natural form of the foot, pares away so much of the sole for this purpose, that there is not enough left to defend the sensible parts from the blows and pressure to which it is necessarily exposed; for, if the shoe is not made so flat as to bear on this thin part, any vacancy that is left is soon filled with dirt or gravel in travelling: and the same effect is produced as if the shoe were in contact with it. The method of detecting and treating this kind of lameness is similar to that we have recommended in wounds of the foot; that is, by pressing it, or striking it lightly with a hammer; and giving free vent to any matter that may be confined.

A horse is sometimes observed to be tender

from this cause, immediately after shoeing, particularly in the fore feet; and it will generally be found that the tenderness arises from the toe having been pared too much. If the shoe does not press on the thin part, the horse should be allowed to rest a few days, and a little tar ointment should be applied to the sole, by which it will acquire its usual firmness; but if the shoe is bearing on the sole, it must of course be taken off and altered.

I have known many cases of lameness, from matter forming under the sensible sole, without any apparent cause. It is probable, however, that, in almost all these cases, it was occasioned by a bruise. I have known it happen in several instances at grass; also in the stable, when the horse has been at rest; or while he has been doing his ordinary work.

The following cases are given as examples of such lameness, and of the manner in which they were treated.

CASE I.

About forty cavalry horses were turned to grass in soft meadow ground, their shoes having previously been taken off, and the fore feet pared. About two or three weeks after several of them were observed to be very lame; and on examining the feet it was found that matter was con-

fined under the sole. All the horny sole, which had separated, and by which the matter was confined, was completely removed, a hollow shoe applied, and the whole of the bottom of the foot covered with digestive ointment; when they all got well in a short time. From this we may learn that when a horse is turned to grass without shoes, his feet should be pared with caution; perhaps it would be the safest plan, merely to rasp the bottom of the foot to a level surface, and leave the sole untouched. It must be recollected, however, that, in certain cases of lameness, thinning the sole, previously to the horse's being turned to grass, is recommended as a remedy.

CASE II.

A horse that had been at grass some time was observed to be lame; he was taken up and examined by the smith, who could not find any thing to account for the lameness, and, therefore, concluded it must be in the shoulder. On examining the foot, I found a little moisture oozing from a small fissure in the coronet; and, on finding the horse flinch, when struck on the bottom of the foot, towards the inside heel, I pared away the horn from that part with a drawing knife, and let out some dark-coloured fluid. A separation between the sensible and horny sole had taken place to a considerable extent.

All the horny sole that had been detached was carefully removed, and a dressing applied of digestive ointment. The fissure in the coronet was dressed at first with a solution of blue vitriol, afterwards with Friar's balsam. By this treatment the horse soon became perfectly sound.

CASE III.

A horse had been fired for a lameness in the fetlock joint of one hind leg, and turned loose into a large box: about three or four weeks after, he was observed to be lame in the other hind leg; the smith was called in to take off the shoe, and examine the foot; nothing was found to explain the lameness in the foot, or in any other part of the limb, except that the horse generally stood with the fetlock joint bent, resting chiefly on his toe. This was supposed to arise from some injury of the fetlock joint, as the position in which he stood tended to favour the ligaments of that part; at the same time it was observed, that there was neither increased heat, swelling, nor tenderness of that joint. It was supposed, however, that the lameness was similar to that in the other leg; and, as firing had proved effectual in that case, it was thought proper to have recourse to it in this also. I was sent for to perform the operation; and, on my arrival, being informed that the foot, as well as

every other part, had been already carefully examined—we proceeded immediately to the operation. The horse had been fired on the outside of the joint, and turned over, that the inside might be fired also. At this time, a little matter was observed issuing from a transverse crack, or fissure, in the coronet. This immediately led me to suspect that matter was confined under the sole. On paring it away, this was found to be the case; and so far had the matter penetrated, that it was found necessary to remove about one half of the horny sole. The same treatment was adopted as in the former case, and the horse gradually recovered. This case shows how necessary it is to examine every part minutely before a severe operation is resorted to; and may teach the young practitioner, that he should never trust to the smith on these occasions, but depend only on his own investigation.

CHAPTER XXVI.

AN ACCOUNT OF SOME EXPERIMENTS AND CASES RELATIVE TO GLANDERS AND FARCY, WITH SOME OBSERVATIONS OF PROFESSOR VOLPI, OF THE VETERINARY SCHOOL AT MILAN, AND OF M. BARTHELEMY, PROFESSOR AT THE VETERINARY SCHOOL AT ALFORT, NEAR PARIS; EXTRACTED FROM A COMMUNICATION MADE BY THE LATTER PROFESSOR TO THE ROYAL AGRICULTURAL SOCIETY OF FRANCE.

"I cannot conclude," says M. Barthelemy, "my account of Professor Volpi's work without speaking of the glanders. What the author has written with regard to this disorder is the more interesting and important from its showing that those veterinarians who wish to propagate new opinions relative to the disease cannot accuse him of a blind attachment to ancient errors. 'The glanders,' he says, 'is caused only by contagion; and the opinion of those who pretend that this formidable disorder is not in its commencement contagious, but may become so during its progress, is certainly erroneous. This opinion has led some young veterinarians to believe that the glanders is not contagious under any circumstance; and

I know one,' adds M. Volpi, 'who, coming to a regiment under this prejudice, neglected to separate glandered horses from the rest until the infection became general.'

"The moment a horse is suspected he should be carefully separated; and it is much more commendable to exercise what may be considered an unnecessary degree of severity upon this point, than to appear deficient in the most trifling circumstance."

Among a great number of cases which the author might have related, had it appeared necessary, he has given only the following:—

"1. Many sound horses having been placed in a stable in which, a short time before, some glandered horses had been kept, they were all affected with glanders.

"2. A troop horse that had a cataract, but was in other respects sound, was sent to the Veterinary School at Milan, to have an operation performed upon his eye; and as the operator did not believe that glanders was contagious, he did not object to the animal being put into a stable were there were some glandered horses. When they had seen as much as was necessary of the effect of the operation, the horse was sent back to the regiment, and in about two months after was completely glandered.

"3. In the month preceding that in which

M. Volpi revised this article it was found necessary to destroy nearly all the horses of a cavalry depôt, consisting chiefly of remount horses (recruits), because the person who had the care of them did not believe that the glanders was contagious, and had therefore suffered those which happened to be attacked with glanders to communicate with the rest. M. Volpi acknowledges that the glanders is not curable except at its commencement. He knows that Professor Collaine has cured the disorder by means of sulphur, given in very large doses, and kermes; but he recommends Ethiop's mineral, and injections of lime water into the nasal cavities. Of all the glandered horses which the author is certain of having cured, he reports sixteen, and describes each case in succession. One of them had been glandered eight months, and was then given to him from a regiment of chasseurs. After curing this horse, M. Volpi sold him to an officer of the regiment to which he formerly belonged, and who knew of his having been given away as a glandered horse."

The following is extracted from a French abridgment of Professor Volpi's Treatise on Veterinary Medicine, in two 8vo. volumes, in Italian.

After stating that the glanders is peculiar to single-hoofed animals, and that it often makes great ravages, especially in regiments of cavalry, he gives a description of the symptoms, and then observes, that "the glanders is by many attributed to unwholesome food, to ill usage, and want of sufficient nourishment, to violent colds badly treated or neglected, &c.; but," he adds, "the only cause capable of producing it is *contagion*. The comparison that has been made between glanders and syphilis is not without foundation. Glanders is often associated with farcy, and many assert that they are the same disorder; it is certain, however, that farcy is much more easily cured than glanders.

"When glanders is recent it is curable; when of long standing, the organic lesions it produces render all our attempts fruitless. These lesions prove that the disorder is of an inflammatory nature (*que la diathèse de la maladie est celle du stimulus*), and indicate the use of counter-stimulants (*contre-stimulans*); and as in chronic diseases the remedies employed are a long time in producing their effects, so it is necessary to continue the treatment of glanders until the desired effect is produced; is it neces sary also to increase gradually the dose of the remedy. It is absurd to consider the submaxil-

lary glands as the focus of the disorder, and to believe that by their extirpation the cure is promoted. It is the same with regard to the tying the temporal artery, which has also been considered a remedy.

"The treatment consists in giving the black sulphuret of mercury (Ethiop's mineral) in a dose of half an ounce every day, and continuing it until the animal seems to feel a kind of nausea (*un espèce de dégout*), want of appetite, and a slight salivation; giving also lime water until these symptoms disappear, and then resuming the use of the black sulphuret, and thus successively until the disease is cured. The nostrils should be syringed with lime water daily. The disease was thus cured in about from two or three to five months."

FARCY.

"The farcy is a chronic cutaneous disorder peculiar to single-hoofed animals, characterized by a series of small tumours situated under the skin, joined together by a kind of cord. They are, in fact, tumefied lymphatic glands, and the cord which unites them is a tumefied lymphatic vessel. This disposition of the tumours constitutes farcy cords. The tumours are at first

small, hard, indolent, and without heat; they gradually enlarge, and, for the most part, suppurate, while others pass out through the skin (*sortent de la peau*), in the form of small mushrooms (*petits champignons*). When farcy attacks the legs, they are generally swollen, and the animal is lame. When the disorder is severe, there is generally a discharge from the nose, which inexperienced veterinarians have attributed to a secondary glanders, and which is nothing more, in fact, than a determination of the disease to the nostrils; sometimes however, the glanders is joined to the farcy, and then the case is exceedingly difficult. This disorder can be produced only by contagion. The opinions of those who deny its contagious character repose on too small a number of facts to merit any confidence. It is not an uncommon circumstance for a man to have connection with a woman affected with the venereal disease, and escape the infection: does any one conclude from this that the venereal disease is not contagious? The eruptions which often accompany large wounds, especially those of the hock, are not farcinous, but owing to the absorption of pus. The different kinds of farcy described by some authors are only modifications of the same disease. Farcy of the legs, and especially of the hind legs, is most difficult of cure. The

diathesis which prevails in this disorder, though not very manifest at first, is inflammatory; it is therefore to be combated with counter-stimulants, not confining ourselves to local applications, as some veterinarians do, because the cure under such treatment is never radical. It is absurd to suppose the disease can be circumscribed by drawing the actual cautery all around the affected parts. The treatment ought to consist in the administration of some aloetic purgatives, in shaving off the hair around the affected tumours (*farcy buds*), opening them with a knife or actual cautery when soft, and anointing them with citrine ointment (*pommade oxigénée*), or some ointment of that kind."

I cannot refrain from making some observations upon the preceding extract from Professor Volpi's work, which I consider valuable, inasmuch as it shows us the importance of never losing sight of the contagious nature of glanders, and encourages us to hope that if attended to at its commencement a cure may be generally accomplished.

It is now twenty-six years since I have been devoting a considerable share of my attention to this subject; and the result of a very extensive experience is, that glanders is very similar to the venereal disease, and that both may be

cured by the same remedy, that is, by a judicious administration of mercury. Professor Volpi is the only author I have met with who asserts that both glanders and farcy originate in contagion *only*. I have long held this opinion, and am also convinced that farcy is always a symptom of glanders, and can be cured, radically, only by the same remedy. I have seen a considerable number of horses that had been cured of farcy become glandered at different periods afterwards: in one case after a period of five months; therefore I am led to suspect that many of the supposed cures that have been published have terminated in a similar manner. The only secure method of treating the farcy is to give some preparation of mercury until the mouth is slightly affected, or until it causes loss of appetite or sickness. It should then be discontinued a short time, but given again as soon as the horse has recovered his appetite, and the soreness of the mouth is gone off. The mercurial course should be continued in this way until the farcy is perfectly eradicated. In the local treatment of the disease we must be guided by circumstances. If there is much inflammation, fomentations and a dose of opening medicine may be necessary; more commonly after the farcy buds have suppurated, and become ulcers, mild caustics have been found most

useful, and blisters. As M. Volpi has found aloetic purgatives useful, I should be inclined to give his plan a trial when the mercurial course appeared insufficient, or when any circumstances arose to indicate the propriety of giving purgatives; but, according to my own experience, it is from mercury alone that we can expect a radical cure. I have seen the farcy begin with inflammation and swelling of the limbs, the lips, and nose, or of the testicles, and accompanied with general fever. Sometimes it is preceded by a loss of flesh, and a great degree of general debility.

Most practitioners, I believe, employ corrosive sublimate for the cure of farcy, in daily doses of 8 or 10 to 15 grains; but I am satisfied that the milder preparations are preferable.

From the striking resemblance observable between farcy cords and buds and the disease produced by inoculating a horse or an ass with glanderous matter, I was first led to suspect that farcy is often nothing more than an accidental inoculation, either by the horse himself, or by those who have the care of him. But when it appears in the violent form just alluded to, or is preceded by loss of flesh, and general debility, it more probably depends upon glanderous matter having got into the circulation: yet why it should produce such different effects,

as violent inflammatory action in some, and a gradual wasting and loss of strength in others, is not perhaps easily accounted for. It is obvious, however, that when it appears in a discharge of matter from the nostrils, the poison finds an outlet, and the constitution seems to be relieved by it. It has been clearly proved that glanders is produced by swallowing glanderous matter either with food or water, either immediately after it has been discharged from the nose, or some time after, when it has become dry and hard. But such are the preservative powers of the stomach, that it will sometimes overcome the poison, in the same manner that it does mineral poisons. I have met with horses so hardy as to resist the glanderous poison when applied by inoculation, and with others that were not infected until they had been inoculated several times; but on young asses its effect is quick and certain, and almost always fatal in a few weeks; it is nearly the same when glanderous matter is given to a young ass with some oats for several days. I have seen an old horse that was sound, put into a stable with glandered horses, and worked with them a considerable time, without contracting the disorder. I have seen another sound horse put into the same stable, and worked like the former horse, with the glandered team, and he contracted the disorder in about six weeks.

The effect produced by glanderous matter, whether applied by inoculation, or swallowed, depends upon two circumstances: viz. the quantity of matter applied, and the state of the horse's constitution that receives it. I have inoculated a young ass with matter taken from the nose of a horse so slightly glandered, that it was scarcely perceptible, and the matter was perfectly free from any bad smell, yet the most violent effect was produced. I once inoculated an ass with glanderous matter, and it appeared to produce no effect upon him, therefore he was sent away, and the suspected horse was still kept, and put under medical treatment; but, about two or three weeks after, I was informed that the ass was ill. When I came to the field where he was kept, I found him dead with a large farcy ulcer in the part where he was inoculated, and farcy cords and buds going from it: he was completely glandered also. I once diluted glanderous matter with more than ten times its weight of water, and filtered the mixture. I then inoculated an ass with the filtered fluid; it produced an ulcer, which, after continuing a few days, gradually healed. I also inoculated a horse with some dry glanderous matter moistened with water, which had been kept in a box from the 24th of March to the 13th of June; it produced an ulcer which spread a little at

first, then remained stationary for a few days, and afterwards gradually healed.

If a bit of lint or tow, soaked in glanderous matter, be put under the skin of a horse, in the way of an issue or rowel, it kills him in a few days. No other matter than that of glanders will produce any effect by inoculation, except that of chronic grease; even the matter or fluid from a cankered foot produces no effect. When a horse is labouring under that severe kind of grease, in which the discharge is of a dark colour, and very offensive and which is attended with considerable pain, especially when the horse is first moved, the matter, if carefully scraped off with a knife, will produce, by inoculation, a peculiar effect. The part becomes, in two or three days, exceedingly painful and swollen, and the swelling increases to about the size of a French nut; this swelling is highly inflamed, and, in a short time, the skin sloughs off, and leaves a sore full of red granulations: this sore soon gets well without having any thing applied to it; the neighbouring parts are never inflamed, nor are any corded lymphatics seen going from it. One horse that we inoculated with the matter of grease had been inoculated with glanders two or three days before; the effect of the latter was prevented by the former. The matter of chronic grease uniformly produces upon the skin

the effect I have described: but how far it is capable of rendering the horse unsusceptible of glanders can be known only by further trial. The case I have noticed affords encouragement to further inquiry; but as it was necessary to destroy the horse soon after, no certain conclusion can be drawn from it. I have no doubt that, if the inoculation had been performed with sufficient delicacy, the effect would have been similar to that of vaccination; and, when we consider that the latter is capable of preventing one of the most destructive diseases to which mankind is liable, the above experiment, I think, affords a reasonable ground for hope that it will be found an effectual means of preventing the glanders and farcy. It is generally admitted, I believe, that the strangles is a natural disease, or rather a disease of a benign nature, by which the horse's blood is depurated, and his constitution strengthened. It is well known that, when this disorder attacks colts at grass, it goes through its course easily, and requires no kind of assistance from art; and, on the other hand, when colts are taken up before they have had the strangles, and are kept in warm stables, and fed with grain, they often have the strangles in a violent degree; so much so, that the disease sometimes proves fatal, and even the operation of bronchotomy has been

found necessary for the animal's relief. I have known the strangles followed by roaring, an incurable disorder. Another consequence of taking up colts before they have had the strangles is, that they have them afterwards imperfectly and repeatedly, which not only proves very troublesome, but such horses are likewise weak, and always ailing in some way or another. It has appeared, on many occasions, that horses of vigorous constitutions will resist the glanders, or gradually overcome the disease when properly fed, moderately worked, and treated in every respect with care. It will not therefore, I trust, be thought too much to assert that, by keeping colts in a state of nature until they have gone through the strangles, such strength will be given to the constitution as will enable them to resist this malignant disease, provided they are properly fed when taken up, kept in a wholesome stable, and worked in a manner suitable to their age and strength. There may be something specific in the prophylactic power of strangles when it goes through its course at grass, as there appears to be in the disease produced by the matter of grease. It is astonishing to see with what virulence the glanders sometimes attacks horses whose nervous system is kept in an unnatural state of excitement by high keep, and hot close stables; or whose

strength has been worn down by excessive exertion; or even moderate work with unwholesome provender. I have lately seen a horse so badly glandered that he could scarcely breathe, and who discharged matter enough from his nostrils in one day to poison all the horses in Somersetshire. This horse had been glandered only a few days, and was destroyed immediately after I had examined him. It is to be regretted that no law has been enacted, as there has been in France, to prevent glandered horses from being worked or kept. (See vol. i.) I have seen matter taken from the nose of a glandered horse, so slightly diseased, that no one suspected him of being glandered; the only thing complained of being a swelling under the jaws. I have also seen an ass inoculated with this matter, and it produced a most virulent farcy and glanders.

CHAPTER XXVII.

OBSERVATIONS ON THE STRUCTURE, ECONOMY, AND DISEASES OF THE HORSE'S EYE.

Of all the organs of the body, the eye is by far the most delicate and interesting in its structure and economy; and though a knowledge of this subject may lead to the prevention of its diseases, it will do but little towards curing them. Sometimes, indeed often, a temporary cure is effected, and the eye may appear free from disease a considerable time; but the disorder always returns sooner or later, and eventually produces blindness, or imperfect sight, in one or both eyes. In describing the anatomy and physiology of the eye, the most convenient method is to divide the subject into two parts, that is the eye itself, and its appendages. Under the latter head is comprehended the eyelids, the muscles which move them, the eyelashes, the lachrymal gland, the puncta lachrymalia, and lachrymal duct, the caruncle of the eye, the haw, and the membrane named conjunctiva, and the muscles by which the eye is moved.

The palpebræ, or eyelids, are opened and

shut by two kinds or orders of muscles. The one, composed of circular fibres, and named orbicularis, is situated immediately under the skin, and, by contracting, closes the eye-lids; the other, named levator, is composed of straight fibres, is situated under the upper eye-lid, and, by contracting, opens the eye-lids. The margin of the eye-lids is smooth and thickened, and secretes a mucous fluid, as well as the hairs, named cilia, or eye-lashes. In the horse there is only one eye-lash, that is, the superior, which serves to keep out dust from the eye, and moderate the light which comes directly from the sun, without offering any impediment to the reflected light, which comes from the surface of the earth. Immediately under the superior part of the orbit, or socket of the eye, and rather towards the inner corner, there is a gland of considerable size, which forms the fluid named tears. This fluid is conveyed to the under surface of the upper eye-lid, and is then diffused all over the eye, by the motion of the eye-lids, as well as by the motion of the eye itself. As the tears accumulate, they are directed, by the closing of the eye-lids, towards the inner corner, where they are received by the open extremities of two ducts which, soon uniting, form the lachrymal duct, a long membranous tube which terminates in the lower part of the nostril, where

it may be distinctly seen, with the fluid named tears, flowing from it. The inner surface of the eye-lids is formed by the membrane, named conjunctiva, or membrana conjunctiva, which passing inward, embraces the globe of the eye, and serves to keep it in its situation; at the same time it is sufficiently loose to admit readily of all its various motions. This membrane, in its healthy state, is nearly white; but in all cases of internal inflammation, or inflammatory fever, becomes very red. In staggers, and some other disorders of the stomach, and organs subservient to digestion, it becomes of a deep yellow or orange colour. This membrane is closely united to nearly one half of the sclerotic coat, or white of the eye, and has been thought to be continued in a very attenuated and transparent state over the cornea also. In injuries of the eye, this membrane becomes red; but, in internal diseases, it should always be examined, as redness in that case indicates general inflammatory action, and points out the necessity of copious bleeding. In the inflammatory disorders of cows, this redness is not so observable, nor is yellowness so observable in the disorders of the digestive organs; this is owing to the density of the membrane, and to the dark or dusky colour of the sclerotic coat, which is not white as in other animals; in all cases of internal inflamma-

tion in cows, the larger vessels of the conjunctiva may be seen in a state of distension.

In sheep the redness is observable, especially in the latter stages of the disorder named gid or giddiness, or hydrocephalus, from hydatis, in one of the ventricles of the brain. (See vol. iv.) In the inner corner of the eye there is a small fleshy eminence, named caruncle, which separates the two open extremities of the lachrymal ducts, named puncta lachrymalia, and thus allows the tears to be forced into them by the contraction of the orbicular muscle. In the human eye, the tears pass from the puncta lachrymalia into a small bladder or sac, which does not exist in the horse; in him there is one continued membranous tube from the inner corner of the eye, to the lower part of the nostril. The termination of the lachrymal tube, or duct, in the horse, has often been mistaken for an ulcer in horses suspected of glanders; but it does sometimes become ulcerated from the acrimony of the tears, or from the strong preparations that are sometimes applied in diseases of the eye. I have seen this happen from the application of powdered sal ammoniac (muriate of ammonia) to the eye. Sometimes the termination, or orifice, of the lachrymal duct becomes closed by inflammation, or the cicatrization of an ulcer, and then it bursts above, and the ruptured

part becomes an ulcer. According to Lafosse, the disease named fistula lachrymalis, takes place in the horse; but of this I have seen only one case. In glanders, however, there is often, indeed generally, a slight purulent, or mucous discharge from the inner corner of the eye, which probably proceeds from the lachrymal duct. The membrana nictitans, or haw, as it is commonly named, is situated in the inner corner of the eye. That part which comes over the eye is a thin slippery membrane, which, towards its basis, becomes thicker, and cartilaginous. Its basis is of some thickness, and imbedded in fat; there are no muscles attached to it; but when the eye is drawn into the orbit, and towards the inner corner, the basis of the haw is prevented from following it, by the bones of the orbit; the thin membranous part of the haw is thus forced over the eye, and serves to remove dust or flies that may have fallen upon the cornea.

The eye is moved by seven muscles, which arise from within the orbit, or socket, and terminate in thin sheets of tendon, which, with the sclerotic coat and conjunctiva, form what is called the white of the eye. There are two muscles to move the eye upward, and two to move it downward; one to move it obliquely outward, and one to move it obliquely inward. This last is worthy of particular notice, for in

the horse, as in the human eye, its tendon, which is longer than the rest, instead of being attached like the others to the sclerotic coat, first passes through a hole in the superior part of the orbit, it then turns inwards, and is inserted into the sclerotic coat. By this contrivance, a greater degree of motion is produced in the eye, in an oblique direction outward, so as to make the eye express the passions of the mind. This muscle enables the horse to look behind him, and is often exerted in vicious horses, making them look sour or suspicious, and show the white of the eye.

In the horse there is a seventh muscle, named retractor, which arises from the bottom of the orbit, surrounds the optic nerve, and is inserted into the posterior part of the globe of the eye, or sclerotic coat, about midway between the optic nerve and the cornea. Its use is to draw the eye into the orbit, which it does with considerable force. The various motions of the eye are rendered easy by its being imbedded in fat.

Having described the appendages, as they are termed, I shall proceed to a description of the eye itself, the structure and economy of which is most curious and interesting. It is said to be composed of coats and humours, and this perhaps is the best manner of considering it. The first coat that appears is the cornea, or

glass of the eye, which forms the anterior part, and is beautifully transparent. It is not of a circular form, as in man, but of an irregular oval or rather oblong form when examined out of the socket; but in its natural situation in the living horse, that part which projects beyond the eye-lids is a regular oval, or rather of an oblong form, and corresponding in some degree with the form of the pupil. It forms a larger portion of the globe of the eye than in man, and by its convexity, causes the rays of light which pass through it to converge towards the pupil. This convexity may be too great or too little, and in either case render vision somewhat imperfect, and cause starting. The convexity of the cornea is preserved by the fluid which it incloses, named aqueous humour. On puncturing the cornea this fluid escapes, and then the cornea becomes flat and wrinkled. On removing the cornea the iris appears, which is a thin delicate brown or blackish muscle, with an oblong hole in the centre, named the pupil. The iris is composed of two orders of fibres; the one circular, which, by contracting, diminishes, and even closes the aperture in the centre, named pupil; the other radiated, which, by contracting, opens or enlarges the aperture or pupil. The second humour of the eye is situated immediately behind the pupil, and is named the crys-

talline humour, or crystalline lens. On taking it out it appears to be a solid and beautifully transparent double convex lens, the posterior surface of which is more convex than the anterior one. It is found to become denser and denser from the circumference to the centre, and the slightest pressure so deranges it, as to lessen or destroy its transparency.

The crystalline humour may be considered as composed of numerous concavo-convex lenses admirably fitted to each other; those of the largest size having their circumference or edge opposed to and nicely joined to each other, thus forming altogether a double convex lens. The point of union between the two largest lenses is embraced by a band of muscular fibres, disposed in a circular direction, and named the ciliary ligament. These by contracting, assisted probably by the muscles of the eye, increase the convexity of the crystalline lens, or rather of the series of concavo-convex lenses, of which the eye is composed, in a manner so just and equal, as to adapt it to the distance of the object at which the animal is looking, while, by the relaxation of these muscular fibres, the convexity of the lens is diminished by its own elasticity. These changes take place with inconceivable rapidity and accuracy. There are other muscular fibres

proceeding from the band of circular fibres named ciliary processes in a straight, or rather radiated, direction, towards the second coat of the eye, named tunica choroides; these are so arranged as to be drawn into folds, by which disposition they are enabled to perform their office more easily, which is that of drawing the lens towards the optic nerve, and thereby increasing the intensity of vision, whereby the animal is enabled to see small objects distinctly. The crystalline lens is enclosed in a transparent capsule, which is not in contact with it, there being about one drop, as it is computed, of a transparent liquid interposed, which, from the anatomist's name who first observed it, has been called 'liquor Morgagnii.'

I have seen a case where the convexity of the lens has been so increased, by an unusual degree of contraction of the circular fibres, named ciliary ligament, that it burst the capsule, and was forced out of its situation. I found it lying with its posterior convex surface on the inferior margin of the iris; about half of it appearing in the anterior chamber of the eye, as it is termed. The transparency of the lens was not affected, at least it did not appear so to me, and I rather think the accident had occurred just at the time I observed it, from twitching the horse violently.

In cataract, a disorder in which the crystalline lens becomes opaque, it always becomes globular in its form from an irritable state of the band of circular fibres; the same effect may be observed in the circular fibres of the iris, causing the pupil to be small, even in a moderate light, while the inflammation is going on which occasions the cataract; but when the opacity is such as to exclude the light from the posterior part of the eye, which contains the third or vitreous humour, with the choroid coat, retina, and optic nerve, then the circular fibres relax, and the radiated fibres draw up the iris somewhat irregularly, which adhering to the capsule of the opaque lens, the pupil remains permanently open, as in fig. 2, Plate IV.

In the human eye the pupil is black, and of a circular form, and forms what is commonly called the apple of the eye. In the horse, it is of a dark blue colour, and of an oblong figure, with its long diameter always parallel to the horizon, in whatever position the head may be placed. This uniform parallelism of the long diameter of the pupil with the horizon is effected by means of the oblique muscles before described. In Plate III, fig. 1, an error may be observed in this part, for the long diameter of the pupil, instead of being parallel with the horizon, has been drawn a little obliquely. A

similar error may be observed in fig. 1, Plate IV, but in a less degree. See rough sketch of the Eye, page 295.

When the horse stands in the stable in a moderate light, the pupil is open or large, by the preponderant action of the radiated fibres, as in Plate I, fig. 1, Vol. 1, or as in the rough sketch; but when taken out of the stable, the circular fibres prevail, and the pupil becomes much smaller, as in Plate III, fig. 2; and if the eye be exposed to the sunshine, the pupil becomes smaller still, and scarcely perceptible.

When the nervous structure of the eye is morbidly irritable, as in ophthalmia, the pupil continues small, and sometimes nearly closed, even in a moderate light. But when the lens becomes opaque, the ophthalmia and morbid irritability cease, and the pupil then becomes open and irregular in its form, as in Plate II, fig. 2, Vol. I, (13th edition). Plate II, fig. 1, represents a partial opacity of the lens, or partial cataract; or, as it is more commonly called, specks in the pupil: here the form of the pupil is not altered, and it remains capable of contracting or opening, according to the degree of light it is exposed to.

All that part of the eye which is posterior to the iris is chiefly occupied by the third, or vitreous humour, and it is in this humour that

the crystalline lens is imbedded. The vitreous humour is perfectly transparent, and consists of a fluid, inclosed in numerous small transparent cells, all of which appear to be inclosed in one delicate transparent membrane, named tunica arachnoidea. If the vitreous humour is cut, by snipping it with scissars, a fluid, like water, drops from it freely, so that it appears to be nothing more than water, probably holding a little salt in solution, which escapes when the transparent cells are thus cut open.

That part of the vitreous humour in which the lens is imbedded is different from the other parts, and of the consistence of jelly. Immediately behind the ciliary ligament, as it is termed, the arachnoid coat may be inflated with a small blow-pipe, and made to resemble a circular canal; this has been called, from the name of the person who first observed it, the circular canal of Petit. It is supposed to be connected with the radiated fibres of the iris. I have seen the whole of this humour in the eye of a sheep that had an hydatid in the right ventricle of the brain of the consistence of jelly.

It is now time to speak of the optic nerve, and its appendage, the retina, with the third coat of the eye, named tunica choroides. The retina is a delicate transparent membrane, which embraces the vitreous humour, and is supposed to

be an expansion or production of the optic nerve, serving to receive the impressions of objects, in order that they may be conveyed by the optic nerve to the organ of vision, named thalamus nervi optici, or, speaking of both organs, thalami nervorum opticorum. After death, the retina becomes opaque, and of a light grey colour. It is so delicate a membrane, that there is some difficulty in preserving it for exhibition unless the eye is quite fresh. Under the retina lies the choroid coat, which is nothing more than a plexus of blood vessels, covered with a mucous substance of different colours. In the human eye it is black, which is the cause of the human pupil, or apple of the eye, appearing black; but in the horse it is variegated with mucus of a purple, a blue, a green, and a black colour, which, blending together, causes the pupil to appear of a dark blue colour. This mixture of colours in the bottom of the eye, or choroid coat, has been named tapetum lucidum.

The last and most considerable coat of the eye is the sclerotic coat, which is a very strong thick membrane, including all the other coats and humours, except the cornea. The sclerotic coat forms the greater portion of the globe of the eye, and is intimately united towards the anterior part with the cornea, which may be viewed as bearing the same relation to the sclerotic

coat, as the glass of a watch does to the case. By maceration in water the cornea separates from the sclerotic coat completely.

In the horse there are black pendulous bodies attached to the superior margin of the iris. These serve, like the cilium, or upper eye-lash, to moderate or exclude the direct rays of light which proceed from the sun, without interrupting those which are reflected by the surface of the earth; by this admirable provision he sees what it is necessary he should see, while the too powerful stimulus of the direct rays from the sun are excluded, or sufficiently moderated. These black bodies enable the animal also to close the pupil completely, and thus occasionally, or when the nervous structure of the eye is morbidly irritable, exclude the light altogether. The optic nerve penetrates the posterior part of the eye, not in the centre but rather inwardly: still, however, it is central with respect to the axis of vision, for both eyes are always exerted in looking at objects, and, in doing this, incline a little inwardly, so as to make the optic nerve central with respect to the object, or rather as to the axis of vision.

Anatomists have supposed that, were this the case, the insertion of the optic nerve would cause a dark spot to appear before the eye, and that the nerve therefore enters a little inwardly.

But this is an error, as has been demonstrated by the experiment of the late Dr. Darwin, in which, after looking at a coloured object stedfastly for some time, upon shutting the eyes the impression will remain a considerable time, and in an equal degree upon the insertion of the optic nerve, and every part of the retina, without the appearance of any dark spot whatever. This not only proves that that part of the optic nerve which enters the sclerotic coat, and from which the retina proceeds, is susceptible of the impressions of light in the same degree as the retina, but that the vitreous humour, or rather its arachnoid membrane, performs an important office, in addition to that which it performs as a part of a most beautiful and wonderful optical apparatus: that is, it serves to collect and retain the impressions of objects to afford time for the intellect to judge of their distance, as well as of their different properties. The optic nerve passes through an opening in the bottom of the orbit, named foramen lacerum, and crossing the opposite nerve, terminates in that part of the brain named thalamus nervi optici. This decussation of the optic nerves has been a subject of controversy with anatomists. But the fact is completely proved by an examination of the brain and optic nerves of a horse affected with one cataract only; and by an examination of the

brain and optic nerves of a sheep affected with that kind of hydrocephalus, which depends upon the existence of an hydatid in the right ventricle of the brain; for it is the right ventricle that is generally affected.

In both cases, the nerve which proceeds from the affected thalamus will be found smaller than the other, and it will be found smaller also after it has crossed the other nerve, and to the point where it enters the sclerotic coat of the eye. The thalami nervorum opticorum I consider as the organs of vision, for it is here the impressions of objects are ultimately received.

Diseases of the Eye.

Though the horse's eye is commonly supposed to be subject to a variety of diseases, they may, without impropriety, be comprehended under two heads. That is, disorders which arise from internal causes, and such as are occasioned by blows, bites, and other accidents. The former are generally, I may say almost always, incurable: that is, they are incapable of a perfect cure, or, in other words, the eye is very rarely perfectly restored after being so affected, unless a complete cataract, or total blindness, takes place in one eye, as represented in Plate IV,

fig. 2. In that case the health and strength of the other almost always is perfectly established. This is the best termination of ophthalmia, for so this disorder has been named, that can be expected, for the sight of that one eye becomes gradually fully equal in power and correctness of vision to the sight of two perfect eyes. Another favourable termination is in a partial cataract, as represented in Plate IV, fig. 1. This, however, when occurring in one eye, does not establish the health of the other like the perfect or complete cataract; quite the contrary, for when these specks appear in one pupil, and the other eye appears perfectly healthy, it may fairly be presumed, or it is probable, at least, that the healthy eye will sooner or later be affected with ophthalmia. The eye, however, in which these specks appear, generally has its health established; the ophthalmic inflammation then usually ceases; and though the specks are an impediment to vision in a degree proportionate to their extent, and according to their situation, yet they never increase, nor does the ophthalmic inflammation ever return in that eye: that is, according to my experience, and it is a subject which has particularly engaged my attention. Ophthalmia is said by veterinary authors to be produced by high feeding, without sufficient exercise, by costiveness, and the stimulating va-

pours of foul and close stables. These may assist in the production of the disorder, but are by no means the essential cause. It is over exertion that occasions ophthalmia, such as takes place in trotting matches, matches against time on the road, in competitions between coach-masters and post-masters, or their servants, and other cruel and unfair exertions, in which this generous and useful animal is frequently employed.

In such excessive exertions of the muscular power, the blood is impelled into the delicate vessels of the eye, and produces such derangement in the nervous as well as vascular structure of the organ, as cannot be perfectly repaired. Hence the eye, though apparently cured of the ophthalmic inflammation, remains in a morbidly irritable state, and sooner or later is again affected with inflammation. At length the delicate vessels of the crystalline lens, or its capsule, are ruptured, and partial or total opacity is the consequence; or, in other words, a partial or a complete cataract takes place. When this happens, all that beautiful optical and nervous structure posterior to the cataract becomes disorganized, and goes to decay; and, on opening the eye, all the vitreous humour instantly escapes, being no longer included in cells, but iquid, like the aqueous humour. The tapetum

lucidum loses the brilliancy of its colours, the retina remains, but is shrunk, and in a denser and more opaque state, and the optic nerve is considerably diminished in size. The operation for cataract, therefore, must be useless, and should never be attempted.

Gutta serena, or paralysis of the optic nerve, sometimes occurs in horses; it is always occasioned by excessive exertion, and always productive of incurable blindness. In this case, the crystalline lens retains its transparency; and the disorder, or blindness, may escape a purchaser's notice, unless it be made apparent by placing the horse in a situation where it may be known, by the animal not seeing, or not avoiding, objects which, if he had sight, he would readily do.

Another circumstance deserving a purchaser's notice, is the state or size of the pupil, which is best seen by turning the horse round in the stable, and bringing his head towards the stable door. If the eyes are sound, both pupils will be alike in size, and free from specks. When they are of unequal size, in the same light, the smaller may be considered as having been affected with ophthalmia, and still disposed to the disorder; for it denotes a morbidly irritable state of the nervous structure of the eye.

The same suspicion may be entertained when the pupil is very small (as in Plate I, fig. 2) in

the stable, or in a moderate light. When the pupil is rather circular than oblong, of a lighter blue than usual, and rather larger than might be expected, when viewed in a strong light, it denotes an incipient cataract, and with such pupils a horse will generally be given to starting.

On the first attack of ophthalmia, one or both eyes, generally one only, and that the left eye, becomes dull and watery, and soon after is nearly closed. The tears run over the cheek, and the horse appears unable or unwilling to open the eye, except in the stable, when it is nearly dark. The first thing to be done is to bleed to faintness, however large the quantity of blood it may be necessary to take off in order to produce this effect. The horse must then be kept in a cool, airy, but rather dark stable, and suffered to run loose in it. He must be fed, however, from the rack, or from the manger, and with grass only, if that food can be procured. If there is no grass, he must have only eight pounds of hay in the twenty-four hours, and that divided into four portions; three gallons of water at three different times, and three small bran mashes, that is, about half a peck of bran in each mash. A muzzle will be necessary to prevent him from eating his litter, or the litter may be removed altogether. When the horse is thus treated, no medicine or eye lotion will be necessary.

they cannot do any good. But if an apprehension of bleeding the horse to death, or of starving him, prevents this treatment from being pursued, it may be necessary to give a dose of physic, and, after its operation, small doses of nitre daily. Fomenting the eye with warm water is by far the best topical application while the eye is in a painful, irritable state; but when the inflammation has abated, and the horse is able to keep the eye open, and look at objects without pain, one of the lotions mentioned at page 293 may be applied, either alone or diluted with water, according to the state of the eye.

In inflammation of the eyes from external injuries, such as bites, blows, &c.; copious bleeding is also necessary, and a spare diet: a fomentation of warm water is at first the best application, and when the inflammation has abated, one of the following lotions may be employed.

Sometimes an opacity, or film as it is termed, on the cornea or surface of the eye, is produced by external injuries, and strong stimulating applications are thought necessary for its removal, but such applications always do much harm, unless the inflammation and irritable state of the organ is first completely subdued. If an opacity remains after this has been effected, and the horse is able to keep the eye open without pain, finely powdered salt may be put into the eye,

and repeated for a few days. Stronger preparations are often made use of, such as crude sal ammoniac (muriate of ammonia), sandover or the frit of glass, and even finely powdered glass, either alone or mixed with honey. Powdered white vitriol, or sugar, are sometimes blown into the eye through a quill. Sometimes tincture of opium is made use of, or a solution of extract of belladonna.

In severe injuries of the eye nothing but early and copious bleeding will prevent the most serious consequences, and even this will do little unless followed by a spare diet. Here also physic, and afterwards nitre, may be given, but in these severe injuries, as in inflammation from internal causes, bleeding to faintness, and the spare diet I have recommended, will render all medicine unnecessary, and is by far the best mode of treatment.

In ophthalmia, the disorder often remains in a fluctuating state for months, or even for a year or two, but the sight continues imperfect, and is every now and then getting worse. The disorder sometimes appears to go off rather suddenly, and after a short time as suddenly returns. Sometimes the disorder suddenly leaves one eye and affects the other; and sometimes, though to an unexperienced person the eye appears quite well in the evening, the horse

will be found nearly blind the next morning. From a supposed periodical recurrence of the disorder, it has been named moon blindness; but the disorder does not ever quite disappear; there is always a morbid state of the eye that is readily seen by an experienced person.

A horse that has once suffered from ophthalmia should never be purchased as a sound one, however free from disease the eye may appear to a person not conversant with the subject. But in injuries of the eye or inflammation from blows, bites, &c. the cure is often complete; there is no danger of the disorder recurring, and sometimes a small opacity or film may remain in the cornea or surface of the eye, without any injury to the sight.

In severe injuries, however, there is danger of incurable derangement being produced in the nervous structure of this delicate organ, unless the animal is bled to faintness, and afterwards fed sparingly. In inflammation from excessive exertion, that is, in ophthalmia, nothing but this treatment has any chance of effecting a radical cure, and this, I fear, will too often be found to fail. It is not by one journey, or match, or race that the mischief is done; it is by a frequent repetition of immoderate work, or excessive exertion, that the injury is gradually inflicted. It is thus, from time to time, that the

blood is impelled into the delicate vessels of the brain and the eye, as well as those of all the other organs of the body, so as to distend, and at length rupture them, and such derangement is thus produced in the nervous structure of the eye as to establish a morbid irritability, and such an aptitude to inflammation, that it is brought on by the slightest causes, until the delicate transparent parts are rendered opaque, and the nervous structure deranged or disorganized.

It has appeared to me that the event of an attack of ophthalmia may be generally prognosticated if we can learn something of the history of the horse, and the state of his constitution. If either his sire or dam has been affected with ophthalmia, it is most likely he will be blind; or if he is evidently of a weakly constitution, and has been kept hard when a colt, or broke and ridden hard at two or three years old, there is little chance of recovery. But if he is a horse of a strong constitution, and especially if he has not been kept hard, and ill used when a colt, there is a probability of saving one eye perfectly. The hardier a horse is, *cæteris paribus*, the more effectually will he resist the disorder; and I am inclined to believe that in delicate horses, if we lower the horse's strength by too copious evacuations, we often aggravate

the disorder and accelerate its progress. I have known a strong purgative followed by ophthalmia. Professor Coleman has made a similar observation. I have lately met with a considerable number of ophthalmia cases, and find upon the whole that setons and blisters near the eye, bleeding according to circumstances, a mild dose of physic, and such attention to diet and exercise as will improve the general strength of the animal, are the best treatment. By improving the strength, I do not mean that he is to be pampered with nourishing food; but that he should be so fed and exercised, as to *recruit the strength of the nervous system*, as much as possible. For this purpose, grass is the best food, and pure air the best medicine: when the inflammation has subsided, a run at grass, where he can be sheltered from the sun and from the rain, is the most likely means of preventing a return of the disorder. Mr. Peall, in his observations on the diseases of the horse, relates a striking experiment which he made in a horse affected with ophthalmia. "I have ordered him," he says, "to be removed from the stable, where I observed he kept both eyes shut, into the open air, or to a very cool situation, and have watched the effects of the change. In the course of half an hour, I have commonly found him begin to open his eyes gradually, and in

the course of two or three hours, to keep them open boldly, and for a continuance, even though the situation he was placed in was not darkened or shady; for it cannot be denied that strong light is very prejudicial in such cases. Now to prove that the stimulus of the volatile alkali (the vapours of foul litter) was more offensive to the inflamed organ than that of light, I have placed the animal again in a hot stable, which did not admit much light; and, in the course of a few minutes, have observed him begin to close his eyelids gradually, and, after an hour or two, to keep them constantly shut. Not satisfied however with this, I have removed the horse back again to a cool situation, and have observed the same effects to be produced as have been already detailed."

Eye Lotions.

No. 1.	Sulphate of zinc	1 dram
	Water	1 pint
	Diluted sulphuric acid	2 drops—Mix.
No. 2.	Superacetate of lead	4 scruples
	Water	1 pint
	Distilled vinegar	2 ounces—Mix.
No. 3.	Sulphate of zinc	1 dram
	Superacetate of lead .	4 scruples
	Water	1 pint—Mix.

And, after shaking them together, filter through blotting paper.

Vinous tincture of opium has been employed with advantage in that debility of the nervous structure of the eye sometimes observable in old horses, and indicated by a large pupil of a more circular form, and of a lighter blue colour than usual; also in opacity of the cornea. It is introduced by means of a small camel hair painting brush.

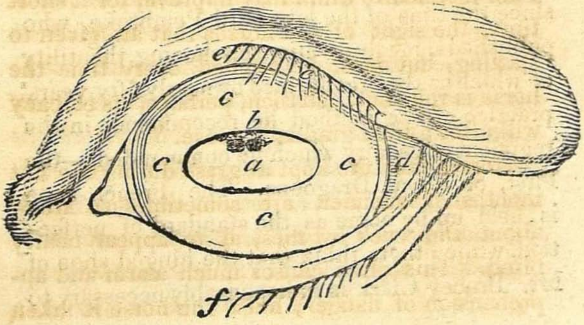
In small, or contracted pupil, extract of bella donna has been recommended. Blistering all the external parts of the eye and forehead has been advised and practised in the 4th dragoons, and was thought to produce a temporary good effect. Setons under the eye have been employed also, and sometimes afford temporary relief; so has blistering the cheek; but no permanent benefit has, I believe, ever been derived from any of these remedies. The vinous tincture of opium, or wine only, or diluted brandy, I am inclined to think may improve, for a short time, the sight of old horses that are given to starting, but must be applied every time the horse is rode out, and then, perhaps, its efficacy will after a time gradually cease.

Horses that are kept at grass during the hot months of summer, are sometimes so stung about the eyes by flies, as to appear nearly blind. This often causes much alarm and apprehension of danger; but if the horse is taken into a cool shed or stable, and the eye bathed

with a little warm water, or a weak solution of superacetate of lead (sugar of lead), the inflammation will soon go off. This may be kept off at any time by means of train oil.

I annex a rough sketch of the eye, thinking it may render the description I have given more clear. The pupil is drawn, as it appears, in an obscure light; and I have endeavoured to draw it in a direction parallel with the horizon; but, being an indifferent draftsman, I have not perfectly succeeded in making the oblong circle of a regular form:—*a* is the pupil; *b*, the small black bodies appended to the superior margin of the iris; *c c c c*, the iris, as it appears when viewed through the cornea, or glass of the eye; *d*, the haw which is on the surface of the cornea; *e*, the upper eye-lash; *f*, a few hairs at some distance from each other, in the under eye-lid.

See *Frontispiece*, and its explanation.



CHAPTER XXVIII.

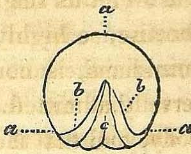
OBSERVATIONS ON SHOEING, AND THE MANAGEMENT OF THE FEET.

So much has been said of late on the subject of shoeing, and so many imaginary improvements have been introduced since we have had a free intercourse with the continent, that an inexperienced person is naturally enough led to imagine that it is a very intricate art, and one that requires a great deal of study and reflection to be understood. But notwithstanding the great attention that has been paid to the subject during the last thirty years, it is rather questionable whether lameness has become less frequent, or whether any real improvement has been made since the time of the late Lord Pembroke, who published some observations on shoeing, the utility of which has been confirmed by nearly fifty years' practice of the method he recommends in the regiment of cavalry which he commanded,—the First, or Royal Dragoons. The French shoe is held up by some as the standard of perfection, while others think that the hinged shoe of Mr. Bracey Clark is indispensably necessary to

the preservation of the foot, and capable also of restoring it, in a certain degree, when injured by other modes of shoeing; for he considers all shoes, except that which admits of some motion in the hoof, by means of a hinge at the toe, to be injurious to the feet, gradually, and sometimes very slowly, bringing on a contraction of the hoof, and the diseases which result from such contraction. I am of opinion that the shoeing of horses is a very simple operation, and requires only experience, common sense, and a certain degree of manual dexterity, to be practised as perfectly as is necessary. If we consider the horse as he stands at rest, we observe that the feet are the basis of the whole body, and that it is desirable that the whole of the lower circumference of the feet should have a bearing upon the ground.

Bourgelat, in his Essay on Shoeing, lays it down as a fundamental law that the shoe should be fitted to the hoof, and not the hoof to the shoe; and this law has been admitted by all succeeding veterinarians; first, as it regards the foot in a sound healthy state, and likewise when defective or deformed. Notwithstanding this agreement with respect to the fundamental law of shoeing, there has been a considerable difference of opinion as to the practice of shoeing,

each party bringing forward plausible arguments in defence of his favourite method. It has always appeared to me that it is desirable to reduce this useful art to as great a degree of simplicity as possible; and to attain this desirable object, we cannot, I think, choose a better guide than Nature. Let us take a view of the horse then that has never been shod, and observe in what manner the foot bears on the ground. We shall then find that the outer edge of the bottom of the foot, named the wall, or crust, forms a large portion of a circle, as in the annexed figure, and that the deficiency in this circle is filled up by the frog. *a a a*, the bottom and outer edge of the hoof; *b b*, the inflected part, named the bars; *c*, the frog. If we look at the foot as it stands on a flat surface, we shall find that every part of that portion of the circle marked *a a a* is in contact with the ground; I think, therefore, that this should be considered as the natural bearing of the hoof, as the horny sole which lies within this circle is rather concave, or hollow, so that it receives no bearing when the horse stands on a plain hard surface. Sometimes the frog is sufficiently prominent to take a part in this bearing; more frequently, however,



it is otherwise, so that neither the sole nor the frog has any bearing unless the horse stands on soft ground, which allows the outer part, or crust to sink sufficiently into it. From this view of the foot it is obvious, I think, that, having rasped the bottom of the foot, *a a a*, to a level surface, there can be no difficulty in covering it with a circular piece of iron, of sufficient width and thickness to have nail holes punched in it, as well as to resist the pressure and blows to which it is exposed.

Now let us see how far the French method of shoeing, so highly extolled by some English veterinarians, is conformable to the law so universally admitted.

They direct the smith to alter this uniform bearing of the outer circle of the bottom of the hoof, by paring away the horn at the toe and the heel, until it is brought to the form represented in the diagram, and then forge a shoe of a similar form. I have given the outline view of the hoof, with a shoe attached to it, copied from M. Janze's view of a perfectly shod foot. The question then, with regard to the French shoeing, is, whether it is conformable or not to the fundamental law which Bourgelat, the great founder of veterinary schools, has laid down.

An outline view of a hoof shod in the plain

English manner is given in fig. 2: fig. 1 is the French shoe. Bourgelat directs that this cur-

Fig. 1. The French Shoe.

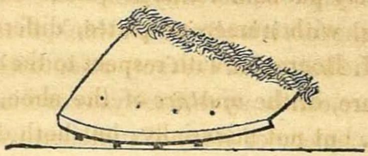
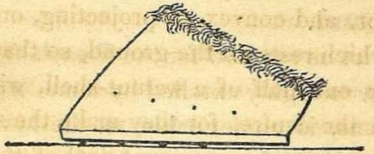


Fig. 2. The English Shoe.



vature, or boat-like form, in the shoe, should be in the following proportion:

The curvature in the branch, or side of the shoe, is to begin at the second nail hole from the heel; and the curvature is to be such, that the toe of the shoe should be raised above the bearing part (tha is, the lowest part, which is to bear on the ground), a distance equal to twice the thickness of the shoe and that from the bearing part to the heel the shoe should gradually rise, so that at the extremity it is raised from the ground a distance equal to half the thickness of the shoe.*

* The convexity of the under surface of the shoe is equal to one and a half times its thickness.

Thus, according to the French method, as a well-shod horse stands on the ground the feet have only a partial bearing. M. Janze, who has lately published a large quarto volume on shoeing, with numerous plates, differs a little from M. Bourgelat with respect to the degree of curvature, or the *ajusture* of the shoe, as they term it, but not materially; but both direct the shoe to be made concave, or hollow, on that surface which is in contact with the bottom of the foot, and convex, or projecting, on the surface which rests on the ground, so that they resemble one half of a walnut-shell, with a hole cut in the centre, for they make the shoe very wide, so as to cover a great deal of the bottom of the foot. I am far from wishing to give an extravagant or exaggerated description of the French shoe, and find some difficulty in describing it so as to be clearly understood; therefore I beg to inform those who feel interested in the subject that they may see a French shoe at most of the veterinary forges in London, as well as in those of the principal towns; and for an exact description of their form, and the advantages supposed to result from it, they may consult Bourgelat's Essai theorique et pratique sur la Ferrure, and the quarto volume before mentioned, entitled, Cours theorique et pratique de Maréchalerie Veterinaire, by F. Janze.

Lafosse, who was cotemporary with Bourgelat, and who greatly distinguished himself, not only as a veterinary writer (see Preface to my First Volume), but as a practitioner of the art in all its branches, differs materially from Bourgelat. In his Dictionnaire raisonné d'Hippiatrique, vol. ii. page 179, he asserts that shoeing should be considered as the basis of veterinary surgery, and that an accurate knowledge of general anatomy is by no means essential to its acquirement; it being sufficient to understand the structure of the part on which the practitioner is to operate, that he may remove only what is superfluous. "Is it not absurd," he asks, "to attempt to instruct them how to shoe horses geometrically, as M. de Bourgelat teaches his pupils? It is difficult to conceive how so chimerical a project could have been attempted, as it supposes in the student a previous knowledge of geometry, which he is probably ignorant of. If he had, like me (he says), handled the hammer, the tongs, and the buttress, such a project would never have entered his head."

In the same volume, page 186, article Ferrure Ordinaire, he gives a description of the shoe he recommends for a sound foot, which is the once celebrated half-moon shoe. This shoe was soon after strongly recommended by Mr.

Osmer, an eminent veterinary practitioner and author, of this country. For good feet, he says, the short shoe is the best; it should be made gradually thinner from the toe to the extremities, and so short that both the heels and the frog may bear on the ground. Very little cover or width is permitted, because the sole, the frog, and the heels are never to be pared, being with this shoe exposed to the pressure and friction of the ground, which is sufficient to wear away whatever is superfluous. There is something in this shoe which strongly recommends it to every one who studies the structure and economy of the horse's foot; yet it has not been found to answer in general practice. Our worthy and truly eminent Professor, Mr. Coleman, was struck with the merit of this shoe, and thought he had succeeded in obviating the only inconvenience that belonged to it, which was, leaving the heels uncovered, and thereby exposing them, especially in wet weather, to more wear than they could bear. He, like Lafosse, strongly pointed out the necessity of applying it to the healthy foot only; and went still farther in showing the danger of applying it suddenly, and without suitable precautions, to the foot of a horse accustomed to wear thick-heeled shoes. He considered some degree of bearing on the frog necessary to the health of the foot, and that it serves also as a spring, and as a stop,

to the animal in his various motions. He found, however, that by leaving the heels uncovered they were often worn down too much, especially in wet weather; therefore he extended the iron covering, or shoe, to the whole of the crust, that is, from the toe to the heels. (See Diagram of the bottom of the foot, *a a a.*)

Mr. Coleman's thin-heeled shoe, as it was termed, was flat on the foot surface, and concave on the ground surface. If the sole was not concave, or hollow enough to admit of a flat shoe of moderate width resting on it, it was pared out sufficiently with the drawing knife; and if the sole was too thin to allow of this being done, the foot surface of the shoe was made concave, and the ground surface flat. The shoe was made of the usual, that is, of a moderate, thickness at the toe, and became gradually thinner towards the heels, and in such a degree, that the toe was three times thicker than the heels. The principal precaution to be observed in applying this shoe was to pare away from the toe of the hoof as much as would make up the difference between the thickness of the toe and the heel of the shoe, and thereby prevent too much pressure upon the great tendon of the foot and coffin joint; and if the heels of the hoof were unusually high, so as to raise the frog considerably from the ground, they were to be lowered very gradually, removing only a

small portion of the horn at each time of shoeing, until the frog had a bearing on the ground.

This shoe was tried in the army, and found frequently to occasion lameness. The principal trial was made in the Royal Artillery, and I had an opportunity of witnessing the effect of it at two different periods. About twenty-three years since, when I was in the Royal Dragoons, and quartered at Canterbury, I was desired by Mr. Coleman to examine several horses of the Royal Artillery, in that garrison, that were said to be lame from wearing the thin-heeled shoe. I did so, and was of opinion that the report was well-founded: therefore I directed the common shoe to be applied, and to keep the feet moist, and at rest for a short time, or until the lameness was removed. A few years after this veterinary surgeons were appointed to the artillery corps, and then I believe the thin-heeled shoe was found to answer better; for when I resided at Exeter, the veterinary surgeon of the artillery quartered in that district was transferred to another station, and I was employed by the Board of Ordnance to attend the horses in that capacity; when I found that Mr. Coleman's shoe, both for the fore and hind feet, had been employed several years, and that no inconvenience had resulted from it; on the contrary, I never saw a corps of horses with better

feet. Their work was regular, and very moderate, chiefly walking, and in harness. It seems to be a general opinion with English veterinary surgeons of the present time that the thin-heeled shoe is not fit for English horses, and experience has shown that no shoe whatever will materially diminish the lamentable frequency of incurable lameness in this country while such facility is given to rapid travelling by smooth turnpike roads, and consequently so strong a temptation offered to thoughtless riders and drivers to urge those generous and useful animals to exertions beyond their capacity. It is painful to witness the unreasonable work that is frequently required from post-horses going from Bath and Bristol to Wells, and from the latter to the two former places. The distance of Wells from Bath is 20 miles of hilly road; from Bristol 22 miles, still more hilly, but both hard and smooth roads. Post-horses are generally expected to go to Bath in two hours and a half, and return the same day, generally without any regard to the load they have to draw. They often go to Bristol in two hours and a half, and return the same day. It is difficult to calculate the amount of loss this occasions; but habit seems to have reconciled post-masters to it, and probably they persuade themselves that no loss is sustained by it. For my own part, I am fully

convinced, after long and careful observation, that whoever works his horses immoderately, or beyond what is considered fair and reasonable, and in such a degree as to bring on diseases, and shorten their lives, injures himself not only in a pecuniary, but also in a moral sense. It is not unlikely, I think, that Mr. Coleman's shoe would be found to answer well in easy or slow work, if employed with the precautions he has pointed out; and the circumstance I have just related, of these shoes having been employed in the Royal Artillery at Exeter, clearly shows that when a horse can work in them without inconvenience, his feet are preserved or improved by them. I am inclined to think that the lamenesses which have taken place at different times in consequence of wearing the thin-heeled shoe, have not arisen altogether from the battering or blows which the frog has received, but sometimes from the increased pressure that has been thrown upon the navicular bone and the great tendon which passes over it. By exposing the frog to pressure it becomes very hard, and capable of resisting the sharpest flints. Mr. Coleman's shoeing is certainly more conformable to the fundamental law which Bourgelat has laid down, and which his successors have so strongly insisted upon, than any other, except Lafosse's. It appears, at first, difficult to imagine how those

French veterinarians, after so seriously admonishing us to fit the shoe to the foot, and not the foot to the shoe, can immediately after recommend this hollow and boat-formed shoe, and direct the hoof to be pared up at the toe and the heel in order to fit it. In M. Janze's elaborate work of 550 quarto pages, and 111 plates, I have found this difficulty explained. Page 203 he observes, "This form of the shoe is established upon a careful observation of the form of the coffin bone, and ought to serve as a pattern for all well-formed and healthy feet." I have examined some coffin bones, and find that when the foot is placed on a flat surface there appears a trifling elevation at the toe; but as the shoe is to be fitted to the hoof, one would naturally suppose that the form of the hoof was to to be followed in shoeing.

Mr. Goodwin, in his new system of shoeing, gives an explanation of the advantages arising from the curved, or French shoe. "If we refer," he says, "to the action of the fore leg, it will tend to explain some of the advantages to be derived from the curved shoe. When a horse is about to move, the first indication of motion is a bend at the knee, which necessarily raises the heels, and they become more and more elevated, till the toe (which is the last part that leaves the ground) is suspended for the

moment that the foot is lifted. The base of the foot, just at its leaving the ground, is almost perpendicular: when the knee is bent to its fullest extent, the foot is then in the same position, with the heels of the shoe pointing upwards. If we consider this first part of the motion of the limb, we find the movement of the foot very nearly describes a semicircle ; and on viewing the form of the joints connected with action, the necessity for a curve at the toe is clearly demonstrated: again, the form of the shoe worn out at once shows that it must be more suitable to put on a new one of that form, rather than to suffer the action of the leg to be opposed until it is worn to that form. In the second part of the action, when the foot comes to the ground again, the quarters and heels touch first, and they are the only parts occupied in placing it on the ground again. There may be deviations from this general rule, as in those horses that have bad action; also when horses are drawing heavy weights it must necessarily differ. The fore legs may be considered simply as pillars of support, having no power of themselves to propel the body forward, progression being entirely performed by the hind parts. If it were not so, the action would be different, as I have before observed it to be in those horses that have great weights to draw ; and this may

be more readily observed in any draught horse going up hill. I have offered these few remarks upon action in order to bring the reader's attention to the curve of the French shoe at the *toe.* This form of shoe certainly harmonises more with the motion of the fore foot than the English does; it affords a greater surface of bearing at the toe than the projecting ridge of the straight ordinary shoe, and is much more calculated to allow of the motion of the leg and foot; the labour of the muscles is also diminished, and the limb being in its natural position, the ligaments have less imposed upon them; they are more at ease, and consequently are not so liable to be strained. The shape of the coffin bone is also another proof of the French system being more consistent with the principles of nature than the straight ordinary shoe. If the coffin bone of a fore foot be placed on a level surface, the quarters and *heels* are the only parts in contact with it, which proves that they are intended by nature to meet the ground first (quere, why the curvature of the heel of the shoe then?) and to bear the greater proportion of weight; but if the quarters of the hoof be removed (lowered, or diminished) to admit of the straight shoe, the portion of weight intended to be borne on the quarters must be thrown upon the heels; and hence the *great mischief* which ensues from

the common (plain) English shoe." I perfectly agree with Mr. Goodwin as to the "decided superiority" of the French method of nailing on the shoes; but the curvature of the French shoe toward the heels is certainly contrary both to his own principles and practice, for he expressly tells us in the foregoing quotation that the quarters and heels are intended by nature to meet the ground first: and the Plate of his improved French shoe shows that he disapproves of the French curvature towards the heels. As a clenching sort of argument in favour of the French mode of shoeing, Mr. Goodwin adds, "In a conversation with Mr. Sewel, the Assistant Professor at the Veterinary College, who has recently twice visited the Continent, to enquire into the state of the veterinary art, he remarked with a degree of earnestness which showed the impression which their mode of shoeing had made on his mind, '*that he had seen more lame horses on his return in the stage coaches from Harwich to London than he had met with during both his visits on the Continent.*'"

Having given what I consider a sufficient description of the French shoe, I shall make a short remark on Mr. Goodwin's improvement, which consists in making the quarters and heels on a level, and the reverse of the French shoe with regard to its surfaces; that is, Mr. G.

directs the foot surface to be convex, and the ground surface concave. This form of the foot surface appears to me to originate in a very absurd notion with regard to the foot: it was thought that by making the surface on which the foot rests incline or slope a little towards the outer edge, it would promote the expansion or spreading of the hoof, or at all events prevent that much-dreaded evil, contraction. This notion, I believe, is fallacious; both expansion and contraction must be prevented by the nails, as far as they go; and if any motion takes place in the horn that is confined by them, it must be either from a bending of the nails or from their becoming loose in their situations. This notion of expanding the quarters and heels, by making that part of the shoe on which they rest slope outwards, is not only very old, but also very foolish, in my opinion, and requires only an examination of the foot, and a little reflection, to appear so.

When the hoof becomes hot and dry, and consequently shrinks or contracts, that contraction is general, but takes place principally in those parts where there is least resistance, that is, at the heels and quarters, and at the upper circle of the hoof, or coronary band.

This contraction of the heels and coronary band must compress, and give pain to the sen-

sible parts underneath, especially in trotting. The great merit of the French shoe consists in its placing no restraint upon the necessary motions of the hoof; there are no nails in the heels, or in the moveable parts of the quarters; and instead of making the nail-holes near the outer edge of the shoe, they are placed nearer the centre, and inclining a little outward, so that the nails are driven through the lower and stronger part of the hoof, where there is no danger of their wounding or compressing the sensible parts.

I shall say nothing here of the various contrivances that have been proposed for expanding contracted hoofs, and for preventing contraction, except that they have all been fairly tried, and found either useless or hurtful; but proceed to an examination of Mr. Bracey Clark's shoe, which has of late found so many zealous advocates. If it is found, after a fair trial, that this shoe, which is called the expanding steel tablet shoe, will either so far improve a horse's feet as to relieve him from lameness, or enable a horse to go better than he can in any other kind of shoe; then the only objection that can be made to it is the price, which I understand is half a crown for each shoe; and this would be an unreasonable objection, because the shoe would be capable of doing what no other shoe can. The peculiar principle of

the shoe consists in a joint at the toe, so constructed as to admit of a limited and small degree of motion between the two branches of the shoe. I have already said that I do not think the various degrees of chronic lameness, which are now so loudly and justly complained of, are caused by bad shoeing: nor do I think that any mode of shoeing will cure them. In making this assertion, however, I wish to be understood clearly: in those chronic lamenesses, I do not include corns, or bruises of the foot from the shoe bearing improperly, or from the nails being of a bad form or size, or from being driven improperly. If I rightly understand Mr. Bracey Clark, he is of opinion that all the shoes hitherto employed, except his, must inevitably produce contraction, by the restraint they impose upon the elastic parts of the hoof. In direct proof of this, he brings forward a few experiments; and, in support of his opinion, he argues with great learning, zeal, and ingenuity; still he cannot get over this plain matter of fact, that the plain English shoe, such as I shall next describe, has been employed in a regiment of cavalry for nearly fifty years without producing the effect generally, or in any degree noticeable, that he has ascribed to it. When I was appointed Veterinary Surgeon to the Royal Dragoons, I waited upon General

Goldsworthy, the commanding officer, who advised me not to make any alteration in the shoeing, as the method they practised, which had been introduced by his predecessor, Lord Pembroke, had been found to answer completely. I continued in the regiment seven years, and found that this was really the case. When I was last at Exeter, that is, in June 1822, some part of the regiment was quartered there, and, upon inquiry, I found that they still shoed in the same manner, and with the same effect. As Lord Pembroke's work is out of print, and perhaps rather scarce, I trust it will not be an unacceptable addition to this small volume, if I transcribe the most interesting part of it, and introduce such remarks as may appear to me useful. "Physic and a butteris," his Lordship says, "in well-informed hands would not be fatal; but in the manner we are now (1778) provided with farriers, they must be quite banished. Whoever lets his farrier, coachman, or groom ever even mention any thing more than water gruel, a clyster, or a little bleeding, and that too very seldom, or pretend to talk of the nature of feet, of the seat of lamenesses, sicknesses, or their cures, may be certain to find themselves very shortly and very absurdly quite on foot." The instrument named butteris, the drawing knife, is generally employed

to remove what appears to be superfluous in the hoof at the time the horse is brought to be shoed. The mischief that is done by paring the foot improperly is of two kinds. If too much horn be pared from the sole, it will be incapable of defending the sensible or fleshy sole; and if the bars or frog are improperly pared, we remove parts which are designed to prevent a contraction of the heels. "Broad-webbed shoes are very absurd things; nothing more is wanted than just iron enough to protect the outward crust of the foot, and to prevent its breaking. The nails in all shoes must be driven slanting a little towards the extreme edges of the foot. Any part of the pressure, towards the inward edge of the shoe, must, of course, in a broad-webbed shoe, loosen the nails, and consequently tear and damage the foot, supposing even the iron of the shoe good enough not to bend. This inconvenience of tearing out the nails, great as it is, is the best that can happen in this case; for, if the iron were to bend, it would press against the inward part of the foot, and lame the horse just as much as if the shoe had not been bevelled off at all, in the proper place for the picker to be put, in order to clean out stones, gravel, &c. Making a groove (fullering) round the edges of shoes, if the iron is not very good, may cause a partial yielding there;

but, if the iron is good, a groove is very useful to protect the heads of the nails. Farriers should always examine a foot before they shoe it, make the shoe, and pierce the holes for the nails further from, or nearer to, the edges of the foot accordingly as they find the foot requires; the holes for the nails should always be pierced slanting rather outwards. The best way to forge shoes, in respect to the nails, is to make the holes for the nails at twice, with two different instruments. First on the outside of the shoe, punch a place, not quite through the shoe, big enough to receive and cover the head of the nail when driven in; next punch a smaller hole from the centre of the above-mentioned larger one, for the blade of the nail, quite through the shoe."

This method of punching the nail-holes, and the remarks on the groove or fullering round the shoe, do not differ materially from that now adopted at the Veterinary College, or from Mr. Goodwin's remarks upon it, who says, "The object of this groove or fullering is to receive the nail heads, but in general it is too superficial for this purpose; when a counter-sink head is used, the groove is made deeper; but the inner edge of the groove is perpendicular, and the outer edge slopes towards the exterior rim to give the edge of the nail a slant-

ing direction inward. It is considered that the smith, who can keep this groove nearest to the edge of the shoe is the best workman, and it is denominated fine fullering. If this groove is cut deep into the shoe, it is evident it must weaken it; and, if the iron is not good, it will crack in the outer edge of the fuller; and, if it is superficial, it affords no security to the head of the nail; yet, if made with accuracy, and deep enough to afford security to the head of the nail, it is a tedious process, and takes up much time. The fuller or groove has been recently altered at the Veterinary College; it is now carried further into the shoe, and is similar to the German method of making the groove, which gives an advantage in taking more hold, by driving the nail through a portion of the sole on the inside of the crust, similar to the French method of nailing. The French nail-hole I consider to be the best; and, in my opinion, it possesses some important properties, but it requires two punches to form it perfectly: the first, a common small countersink punch, which is struck nearly through the shoe, leaving only what is necessary to be opened by the pritchel; every hole having been opened in this way, a large and deep countersink punch is then used to every hole, which must be struck nearly as deep into the shoe as the first punch,

to admit the countersink part of the head of the nail to be buried in the shoe. Much depends on this last punch being driven deep enough; if it is not so, a shoulder will be formed in the hole by the first punch being much smaller than the second; in this case, the nail head, instead of being sunk deep into the shoe, will stand out, consequently it will not be sufficiently secure. Perhaps there may be a little advantage in sloping the inner square of the hole rather more than is done in the French method, to obtain a greater degree of obliquity to the head of the nail. The bottom of the hole is pritchelled in the usual way, only with this difference, that it is made to receive a *flat* instead of a square shank, and to be as near the size of the shank of the nail as possible, that the nail may fit and have a direction outwards. Instead of following the French in their number of holes, which is eight, I use seven, four on the outside, and three on the inside; this leaves the last hole, on the inside, at a greater distance from the heel than the outside, where they are carried much nearer to the end; and, instead of carrying the nails all round the front of the foot, I prefer leaving a solid space at the principal point of wear at the toe. If the quality of the iron is not good, it will be put to the test by the application of the punch; it will either burst on

the outer part of the hole, or cracks or flaws will be seen; neither of which will appear if the iron is good. Having found much difficulty in procuring a good and efficient nail, it is only just to Mr. Watson, of Belper, near Derby, to say, that he has given me great satisfaction in the manufacture of these nails." (Goodwin's new System of Shoeing Horses.) I cannot leave Mr. Goodwin without noticing a remark he has made on an opinion of Mr. Bracey Clark, in which I perfectly agree with him. "Mr. B. Clark prefers the common to the countersink head, believing that it leaves a *degree of room between the shoulder of a nail and the shoe for the* EXPANSION OF THE HOOF. I confess I should not like to commence a journey if there was any play between the shoe and the hoof, as it must be quite clear that, under such circumstances, a shoe could not remain on long. In the *seated* shoe there is not that strain on the nails and in the clenches that there is in the common (hollow or concave foot surface, like the French) shoe; for the crust, instead of bearing on an edge, bears on a flat surface." This last opinion of Mr. Goodwin, as to the advantage of the seated shoe, I shall have occasion to advert to when I come to the conclusion of this subject. After some further useful and ingenious observations on nailing, Mr.

Goodwin says, "I have already mentioned that I consider the foot side of the shoe objectionable, as far as it relates to its concave form," (not its boat-like form, or *ajusture*), "which must produce an unnecessary strain on the nails and clinches by resting on the outward edge of the shoe, causing the clinches to start, and to produce all the bad effects occasioned by their starting. The shoe which I have adopted obviates these inconveniences, and I cannot adduce a proof more convincing of the truth of this than that, on an inspection of the feet when horses are brought into the forge to be shoed afresh, I have generally found the clenches firm in the hoof, and without any appearance of starting, which I consider to arise from the plane of the shoe inclining *outwards*, and embracing the crust so firmly at first that it does not admit of any alteration in the distance between the shoe and the clinch during the time of wear. It, therefore, appears that the following important advantages arise from the French method of nailing, viz. preservation of the wall or crust, and a more secure retention of the shoe on the hoof; and, when combined with the alteration in the form of the shoe which I have adopted, it is calculated to *prevent contraction* and compression of the sensible parts within the hoof."

It is strange, I think, that Mr. Goodwin, after evincing so much ingenuity and sober judgment on veterinary matters, cannot divest himself of the notion of contracting or expanding a horse's hoof by the form of the shoe. The hoof is closely attached to the sensible parts which it covers, and cannot be stretched or expanded by any kind of shoe; but experience has proved that, by attempting to expand the hoof, it may be broken; or, at least, the nails may be loosened, and the shoe thrown off. A plain surface is undoubtedly the best for the shoe to rest on; and, if the sole is good, a narrow shoe only is required, in which seating is unnecessary. The thin-heeled shoe, which allows the frog to receive pressure, tends to keep the heels open; for the pressure made on the frog operates upon the heels, and upon the new shoot of horn at the coronet; as may be seen, on examining the foot, by the evident connexion there is between these parts. Mr. Goodwin says that all the smiths he has met with are of opinion that, after a little practice, they can nail on three shoes, in the French method (or rather Mr. Goodwin's improvement on the French shoe) in less time than two of any other kind. I shall now return to Lord Pembroke's work. "From the race horse to the cart horse," his Lordship says, "the same system of

shoeing should be observed; the size, thickness, and weight of them only should differ. The shoe of a race horse must, of course, be lighter than that of a saddle horse, and so on. A saddle horse's shoe should weigh thirteen ounces and a half (this is the weight of Mr. Goodwin's pattern shoe for a saddle horse); that of a coach or draught horse, one pound three ounces: the nails for the former, one ounce per dozen (Mr. Goodwin's weigh one ounce and three quarters per dozen on account of their large countersink heads: the blades are only large enough to be sufficiently strong): the nails for a coach horse are one ounce and three quarters per dozen. Much the easiest way, and in general the best, is to use a narrow-webbed shoe, all over of one equal breadth, both within and without, with the holes for the nails exactly in the middle. With little or no art, such a shoe is made out of a narrow bar of iron. It must necessarily be always narrow, for there can be no bevel in it, or it would press upon and hurt the inside of the foot (the sole). It has one great advantage over all other shoes, that stones cannot lodge in it." The noble author might have added, that when the horse's sole is firm and sound, it is sufficient for its own protection on any roads; and that, for such a foot, this narrow-webbed shoe is the best of all shoes.

"It is strange that there should be so many ridiculous and absurd methods of shoeing, when it is so manifest that a small share of common sense, with a moment's reflection on the structure of the horse's foot, cannot but suggest the proper one. The shoes in England, at present," his Lordship further observes, "that are contrived with the most sense, are what they call plates for the race horses at Newmarket; I do not say that they are perfect; but they are nearer the truth than any others I know; nor are they substantial enough for common use, though sufficiently so for the turf." (See *Military Equitation*, &c. by the Earl of Pembroke.) Plate shoes are often carelessly fitted; and were they nailed according to the French method, and very carefully, it would be a great improvement.

When we consider for a moment the wonderful performances of our race horses, hunters, and road horses, and how very superior these performances are to those of any other horses whatever, it is difficult to imagine that their action could have been improved, or made easier, by the clumsy walnut-shaped French shoe, or its boasted *ajusture*, i. e. its curved or boat-like form, which seems more fit for a rocking-horse than any thing else. The horse's feet are the foundations of the four pillars which support

the body; and, in a state of nature, have a flat bearing on the ground. A small portion of the outside of the toe may be worn up a little, but this does not affect the general bearing of the foot. The bottom of the foot is the fixed point upon which the muscles of progression exert their power; and if we lessen this basis, or *point d'appui* of the muscles, we diminish their power. I will venture to assert that the horses of the Royal Dragoons, during the fifty years they have been shoed in the manner I have described, have been as sound in their feet, and as free from lameness as any regiment in the French cavalry, or in the cavalry of any other nation; and, if we take the trouble to inquire into the history of the poor crippled horses so frequently met with in this country, and consider in what manner they have been worked, and at how early an age they are generally brought into work, we shall no longer be disposed to impute to our shoeing smiths an evil of which they are certainly innocent.

CHAPTER XXIX.

ON LAMENESS FROM SPLENTS.

In general, splents are not productive of lameness; and though, during the time of their formation, or soon after, the inflammation then existing causes the horse to go lame, yet this gradually wears off, and no after inconvenience is felt: the splent, however, generally remains. But it sometimes happens that a splent is so situated as to interfere with the suspensory ligament, and at others, but more rarely, with the back sinews: in either case, it is proper to attempt their removal, as they are commonly, in such cases, productive of lameness. I by no means approve of those violent remedies that have been often recommended; and though in the first volume, the old plan of bruising, puncturing, and blistering the part has been recommended, or rather spoken of, as a remedy, yet I have, in several instances, seen much mischief done by it, particularly in unskilful hands; but however nicely it is done, it often leaves a permanent enlargement of the leg. It is certainly the most effectual method of removing the splent; but it causes, in general, so much inflammation and

swelling in the surrounding parts, that there is danger of the remedy proving worse than the disease. When this plan is adopted, the cold lotion should be kept constantly to the part as soon as the blister has operated. The following is the method I have practised for several years, and in general with advantage, that is, it puts a stop to that ossific inflammation by which the splent is produced; and which is, in many instances, the cause of the horse's going lame, as we have observed at the commencement of this chapter; and it often diminishes, and sometimes removes, the swelling Let the hair be closely cut from the part, and the liquid blister, or blistering liniment, be well rubbed upon it. On the following morning the part will be found swollen, and covered with a glutinous crust: but if this effect has not been produced, it must be rubbed in again. The fourth morning after, Goulard lotion should be applied as frequently as possible: the best method is to keep some old linen, several times folded, constantly wet to the part. If the swelling extend to the other parts of the leg, these also should be kept wet by means of a linen bandage. It will be proper at night to take off all this, as it would then get dry, and do more harm than good. After a few days, or a week, the inflammation and swelling will have subsided, which will afford an op-

portunity of observing whether the splent is diminished or not; and, about this time, the horse may be led out, and have walking exercise, twice a day. I have often seen lameness attributed to splents, when, upon a careful examination, it has proved to be in the foot; and whenever a horse is brought to me with this complaint, I think it necessary to examine the foot; particularly if there be neither heat nor tenderness in the splent, or if its situation be not evidently such as to affect the ligament or tendon; and I can truly say, that, of the numerous cases of lameness that have occurred in my practice, which have been attributed to splent, not above one in twenty has been really owing to this cause. I have thought it necessary to dwell thus long upon the subject, because it is a very prevailing error, that splents often cause lameness, and an error of importance; for, while the attention is occupied with the splent, the real disease escapes notice, and the horse is unnecessarily punished. With respect to the prevention of splents, I believe we know nothing about it: there seems to be a tendency in all young horses to throw out superfluous bony matter in this part; nor are we acquainted with any method of correcting this tendency. It has been supposed by Mr. Coleman, that, by the inner heel of the shoe being usually made thinner

than the outer, and by the inner heel of the hoof being generally made rather lower than the other, a greater portion of the animal's weight is thrown upon the inner splent bone than otherwise would have been; and that, in consequence of this undue pressure, superfluous bony matter is generated. Whether this be the case or not, it is certainly proper to keep the heels of the shoe and the hoof level. I have seen splents diminished, and the lameness arising from them removed, merely by keeping the part wet with diluted vinegar; or the following lotion may be tried:—

Muriate of ammonia .... 2 drams.
Vinegar .... 2 oz.
Water .... 2 oz.
Spirit of wine .... 4 oz.—Mix.

CHAPTER XXX.

ON LAMENESS FROM RINGBONE.

THE bony excrescences on the pastern, which constitute ringbone, are not always productive of lameness; this happens only when they are so situated as to interfere with the motion of the small pastern or coffin joint: in the latter situation they occasion more considerable lameness than in the former. I have, in several instances, known horses have ringbones on the hind pastern without suffering the slightest inconvenience from them; and the last I met with went through the hunting season without any appearance of lameness. I have found that the only chance we have of curing ringbone, or the lameness arising from it, is a free application of the actual cautery, and blistering immediately afterwards; and even this will not succeed if the ossification has gone so far as to fix the ends of the bones, or glue them, as it were, together, so that the motion of the joint is completely lost. It is necessary, therefore, when a horse is observed to be lame from this disease, to have recourse at once to firing: I would by no means advise trusting to a blister alone; for though it

may sometimes, at a very early period, succeed, there is even then a chance of the lameness returning. When blistering is employed, it should always be repeated two or three times, washing off each blister about the third day after its application, and keeping the part cool in the interval with the Goulard lotion.

With respect to the prevention of ringbone, very little can be done; and the only preventive means we have in our power will appear when the causes of the disease are pointed out. We often find ringbone accompanied with hard, dry, thick hoofs; the heels very deep; and the pastern upright, as it is termed, that is, nearly in a line with the leg, or almost perpendicular. I do not mean to say that the great depth of the heels of the hoof is the cause of this straightness of the pastern, but no doubt it materially contributes to it; and it is equally clear, that, if the heels were kept of a proper depth, and thin-heeled shoes worn, the evil would be in some degree corrected, and the disease perhaps prevented, particularly if the feet were in other respects properly attended to: for they have generally a great deal of superfluous horn, and a tendency to heat and dryness. It will be readily seen, that, in horses with straight pasterns, the principal spring of the fore parts, next to the shoulder, is lost, and that the bones of the

pastern must necessarily suffer, more or less, from concussion. We may not be able, perhaps, to do much in correcting this position of the pastern, but the little we can do will probably be of service, and ought always to be attempted.

CHAPTER XXXI.

ON LAMENESS FROM RHEUMATISM.

THIS is often an obscure disease, and known rather by the sudden changes it is liable to, than by any positive or manifest symptoms. It happens in various parts; and in the foot I think it may be distinguished by the affected part being often colder than the sound foot; sometimes, however, it is warmer. In the joints it is sometimes attended with swelling, heat, and tenderness; and in some cases of rheumatic lameness there is no swelling, or other appearance, to indicate its situation; and we can only infer that it is rheumatic by its going off after a little exercise, and being sometimes permanently cured by a dose of physic. Whenever lameness occurs, *and after a careful examination and inquiry no cause can be found for it*, and especially if the lameness goes off again after a little exercise, we may conclude that it is rheumatic. A mild dose of physic generally does good, and the suspected part may be rubbed with some stimulating embrocation.

In rheumatic affections of the foot, especially when the affected foot is colder than the other,

the shoe should be taken off, and the bottom of the foot pared—then the shoe should be put on again, and the foot stopped with warm tar ointment. Some stimulating embrocation should be well rubbed into the fetlock joint. In summer a run at grass is a good remedy. I have met with cases of rheumatism in which a mild dose of physic has operated with great violence; so much so, that it was necessary to give some arrow-root gruel to restrain the purging. I have thought it may be a useful precaution, in rheumatic affections of the hind leg, when the lameness is considerable, and the pulse quickened, to bleed freely, and add a scruple or half a dram of opium to the physic.

CHAPTER XXXII.

ON LAMENESS FROM CUTTING.

In cutting, a horse sometimes strikes himself so severely, or in so tender a part, as to cause lameness for a short time, but generally, it soon wears off, and he goes on again very well until the blow is repeated. When the blow is inflicted on the inside, and lower part of the knee joint, it is called the speedy cut, because it commonly happens when the horse is trotting fast. The pain this occasions is so severe, that the horse often falls down suddenly from it, which causes it to be considered a very dangerous failing, more especially as it is a failing that is not easily remedied. In carriage horses, the best remedy is to drive them without a bearing rein, which enables them to go with more ease, and without that high action which this gagging rein occasions: at the same time the shoeing should be attended to, and when the part of the foot or shoe (most frequently it is the former) which inflicts the injury has been discovered, it should be rasped away as much as can be with safety or propriety. Cutting is often a consequence of weakness or fatigue; in

such cases the remedy is obvious. The part most commonly injured in cutting is the inside of the fetlock joint, and the common remedy is to make the inner branch of the shoe thicker than the outer branch, gradually swelling it from the toe to the heel. This is supposed to alter the position of the fetlock joint, and place it at a greater distance from the striking foot. As cutting, however, is often an effect of weakness or fatigue, and not unfrequently of awkwardness in going, this remedy often fails. Mr. Moorecroft, on this account, was induced to try another method, quite the reverse of that I have just described, and in a few instances I have found it successful, but am far from recommending it, because I believe it will generally be found to fail. He advises the outer branch of the shoe to be raised in the manner before described, so that it may be higher than the inside. For he says, "When a horse is at rest, he supports his weight equally on both feet; but having the inner heel and quarter raised when one foot is elevated, he must be supported obliquely on the other, and hence have a tendency to fall outwards; to prevent which, he brings the moving foot nearer to the supporting one, by which he strikes it; but by raising the outer instead of the inner branch of the shoe, we necessarily give it a disposition

to lean inwards, which will induce the horse to throw or incline the moving foot farther from the supporting foot." I have seen a severe lameness produced by a horse striking his fetlock joint, which continued for several days, and was mistaken for an injury of the shoulder, because, though it was evident the horse had struck the fetlock joint, he had not even knocked off the hair. Upon a careful examination, I found he had struck that part over which the nerve passes, and had left it so tender that the horse could scarcely bear to have it touched. By keeping the horse at rest, and blistering the part, he got well; but I advised the owner to turn him to grass instead of working him again, which he did, and soon after took him up quite sound.

Mr. Goodwin describes an improvement of the common boot, as it is termed, for defending the fetlock joint, when cutting cannot otherwise be prevented, which may be had at Mr. Long's, veterinary instrument maker, 217, High Holborn, London.

When cutting appears to depend upon weakness, or riding a horse, though it happen to be a moderate journey, until he is fatigued, the most effectual, as well as the cheapest remedy, is to turn him to grass until he recovers his strength.

CHAPTER XXXIII.

PRECAUTIONS TO BE OBSERVED IN PURCHASING HORSES.

It is a very ancient but valuable maxim, that in all transactions "Honesty is the best policy;" and I can see no reason whatever why horse-dealing should not be regulated by this excellent law, for such it ought to be, and really is—*foro conscientiæ.* I have known those who have continued in the practice of never giving a warranty with a horse, and have experienced the advantage of it; for nothing can be more evident that no one who has occasion for a horse would sell one he is accustomed to unless he had some fault; and if we go to a horse-dealer to purchase a horse of five or six years old, it is but reasonable to conclude that the horse has been tried by some other person, and sold for some fault. Still it should be recollected that there are few, if any, horses without some fault or imperfection; and perhaps if the qualifications of riders, even the best, were strictly inquired into, they would be found very deficient: we had better, therefore, go upon the principle of getting a horse that has no serious fault or defect, or what may be fairly deemed

unsoundness; and having purchased such a horse, we should ride him a few days or weeks, and not be too hasty in giving an opinion of him, nor too ready in listening to the opinion or criticisms of others. Having premised thus much, I will proceed to give some further advice, or suggest some precautions, which may be usefully recollected by the purchasers of horses.

The numerous shades which exist between a state of perfect soundness in horses, and those obvious diseases or defects which so clearly constitute unsoundness as to admit of no doubt on the subject, often occasion much trouble and perplexity in the purchase or sale of these animals.

If a person, inexperienced in the mysteries of horse-dealing, wish to purchase a horse, he would do well to consult a professional man, or some one capable of guarding him against any deception that might be attempted, and of pointing out any defects there may be of too obscure a nature to attract his notice. When such assistance cannot be procured, the following hints may, perhaps, be found useful.

It would be useless to attempt a minute examination of a horse while the dealer or his assistants are present: the sloping ground upon which the horse stands for examination gives a deceptive view of his form and height,

while the constant fear he feels of the whip, and the high flown panegyrics lavished upon him, are so perplexing to a person unaccustomed to the business, that he is apt to overlook the most palpable defects: nor is it possible for the most experienced to examine him with all the accuracy and attention that are necessary; as an unobserved flourish of the whip, or some other private hint from the seller, keeps the horse constantly in motion, particularly when the eye happens to be directed to a part that he does not wish to be inspected. I do not mean to say that this is always the case: there are many dealers, no doubt, of strict integrity, who afford ample opportunity to those who wish to examine their horses; and, so far from wishing to practise any deception upon the inexperienced, will never warrant a horse to be sound unless they are convinced that he is really so: but that there are men in the business who have recourse to a variety of tricks to deceive the unwary, is too notorious to be doubted. It is advisable, therefore, after taking a general view of the animal, so as to be satisfied with respect to his figure and action, to ride him off, to some convenient place, where he may be examined without interruption.

The first and most important point to be inquired into is the state of the feet and limbs, and

whether the horse be in any degree lame or not. And though he appear perfectly firm and free from lameness in all his paces, it will be necessary to inspect carefully the feet and limbs, lest there be any defect, which at some future period may occasion lameness. It is a fact pretty well known to horse-dealers,* that a slight degree of lameness is easily concealed, particularly in high-spirited horses, by the stimulus of the whip and spur, and supporting the head with the bridle. To ascertain, therefore, whether a horse be lame or not, he should not be ridden, but a person should be made to run before him, holding the end of the bridle, that the head may receive no support from it; the slightest lameness will then be readily perceived, particularly if the trial be made on rough ground, and on a moderate declivity.

Should it appear that the horse is perfectly

* In a book published a few years since, on this subject, by Mr. R. Lawrence, he observes, that there are two kinds of horse-dealers—the common, and the gentleman dealer; and that there is this distinction between them: "the former is obliged to warrant a horse sound before he can sell him; whereas the latter simply avers that he *believes* the horse to be sound, but *that it is not his custom* to give a warranty. Thus, the first is bound by law; the latter by honour; nevertheless, there are some *eccentric and narrow-minded purchasers*, who, in spite of the numerous bright examples of modern honour, prefer the former mode of dealing to the latter."

free from lameness, the feet and legs are to be carefully inspected, beginning with the former, which should be first viewed in front, as the horse stands, to observe if there be any difference in the form or size of the hoofs. If the feet are very small, and particularly if one foot appears smaller than the other, it affords reasonable cause for suspicion that there is some serious defect: the bottom of the foot is then to be examined; and, if the heels are much contracted, the frog imperfect, and matter issuing from its cleft or division, it is probable that the horse will soon become lame. I would not advise that a horse be rejected merely because the feet have become rather narrow at the heels, and smaller than they were originally. If no difference can be perceived in the size of the feet; if the frogs appear sound, and free from thrushes; and particularly if, at the same time, the horse step boldly and firmly when trotted on rough ground, and down a hill; I think he may be safely purchased, if free from all other defects. The next point to be attended to is the form of the sole, or bottom of the foot, which is, in its natural state, rather hollow, or concave: we sometimes, however, find it quite flat, or even convex: in either case, it is proportionally thin, and unfit for the office it seems to be designed for, that is, to protect the sensible or

fleshy sole, which it covers. The flat sole, however, is by no means so serious a defect as the convex, and, if the horse is carefully shoed, seldom occasions lameness; but, when the sole is in any degree convex, or projecting, it is extremely thin, and incapable of bearing much pressure. A horse with this defect will sometimes step firmly when the sole is protected by a wide, hollow shoe; but he is constantly liable to become lame by gravel getting under the shoe. We generally find, in this kind of foot, that the front of the hoof, or wall, has lost its natural form, having become flatter; it is also thinner, and more brittle, than it is naturally; so that it is difficult to nail on a shoe securely without wounding or *pricking* the foot, as it is termed. This defect, therefore, is of a serious nature, and constitutes unsoundness.

Sandcrack is an important defect, when it runs longitudinally from the coronet into the hoof, and is so deep as to affect the sensible parts of the foot: sometimes, however, it is very superficial, or in a horizontal direction, and perhaps too trifling to deserve notice. It should be recollected, however, that these trifling cracks in the hoof indicate an unnatural dryness of the horn, and, consequently, a tendency to sandcrack: therefore, when such a horse is pur-

chased, proper means should be employed to improve the state of the hoof.

There is no part of the horse which requires a more careful inspection than the foot; for it sometimes happens, that lameness is for a time removed by rest, or a run at grass, and may not again appear, until the horse is put to work. Horses that are foundered are generally much relieved, and sometimes apparently cured, by running at grass; but the lameness invariably returns when the horse is worked or kept in a stable.

A horse's foot may have suffered so far by bad shoeing, improper management, or some unknown cause, that, although lameness may not have taken place at the time of purchase, yet, from its appearance, it may reasonably be suspected that he will soon become lame. Should such a horse be purchased with the warranty of soundness, he could not perhaps be legally returned, if lameness take place two or three weeks afterwards; as the seller would be able to prove, that the horse had not been lame up to the time he was purchased. It may be said perhaps, that the defect in the foot was observed at that time; but it is well known, that we rarely meet with a horse, at the age of six, whose feet are not more or less imperfect, and that a considerable

alteration in form sometimes takes place without causing lameness.

Cutting is a defect often met with; and when it is considerable, that is, when the scar on the inside is large, the parts surrounding thickened and enlarged, and if it appears also to have been recently wounded, it may be deemed a serious imperfection. Cutting on the inside, and immediately below the knee joint, or the *speedy cut*, as it is termed, is also a material defect, as it sometimes causes a horse to fall suddenly in trotting or galloping.

The back sinews are next to be examined, by passing the hand down the back part of the leg. If the tendon or sinew can be distinctly felt, with the suspensory ligament, which lies immediately under it; if the tendon feel clean and free from swelling; and if the leg, on a side view, appear flat, clean, and sinewy, as it is termed; it may be considered as a sound, well-formed leg. But if the leg, on a side view, appear rather round than flat, or rather bent and inclining inwards; if the sinew and ligament cannot be distinctly and separately felt; and particularly if one leg is larger than the other; it may be concluded, that the part has sustained some injury, and that there is a probability of the horse becoming lame, when put to hard work.

If any mark be found on the knees, it is the

safest plan to infer that it was occasioned by falling, though the seller should affirm that it happened in going over the bar, stepping into a boat, or by striking it against the manger.

Few horses are entirely free from splents; they need not, therefore, be regarded, unless of a large size, immediately below the knee joint, or so near the back sinew, or suspensory ligament, as to interfere with their action.

In examining the hind legs, begin with the hock; and if there be any spavin, it may be seen most readily by looking between the hocks. The bones, which form the projection on the inside of the hock, are in some horses rather larger than in others, which should not be mistaken for bone spavin; but there is no great difficulty in making the distinction; for, should both hocks be affected with spavin, it rarely happens that they are exactly alike, or of the same size: and when one hock only is affected, the difference is sufficiently manifest to point out the disease. A side view of the hocks should next be taken; and if there be a curb, it will readily be perceived. Observe, in the next place, if there be any ringbone upon the pastern, which, though a considerable defect, does not always produce lameness. I have lately seen a mare, that was purchased about two years ago, with a ringbone on the hind pastern. She was

not lame from it, and never has been since that time, though hunted regularly for two seasons.

In examining the bottom of the hind foot, we have only to ascertain that it is not affected with canker, or very bad thrushes.

Some horses have a tendency to swelling of the hind legs, or to that discharge from the heels, which constitutes the disease termed grease: and horses with white legs seem to be more disposed to this complaint than others. When a horse's hind legs, therefore, appear to be swollen; if the hair about the heels appear rough, or furzy; or if there be scars on the heels, or an appearance of their having been affected with cracks or ulcers, it may be inferred that the horse is subject to grease and swelling of the legs.

Having finished our examination of the feet and limbs, we should proceed to the eye, which is an important part, and requires the most careful inspection. The most favourable situation for viewing the eye is at the stable door, or under a shed; for when too much light falls upon the eye, so much is reflected by its cornea, or surface, that it is difficult to see the internal parts.

The age at which the eyes most frequently become diseased is from five to six; next to that, from four to five; sometimes, but not

often, it happens after six; after seven, the disease rarely occurs, except from accidents, to which, of course, they are equally exposed at all ages. In purchasing a horse, therefore, about five years old, it is necessary to be particularly attentive to the state of the eyes. If they appear dull, cloudy, or watery; if the lids appear to be more closed than usual; if the inner corner of the eye-lid appear puckered up; and particularly if there be a manifest difference in the appearance of the eyes, they may justly be suspected of unsoundness.

Having taken a general view of the eye, the pupil, or dark bluish oblong spot in its centre, should be closely and carefully examined; and if a difference is perceived in the size of the two pupils; if, instead of a dark blue colour, they appear cloudy, or if white specks are seen in them; a diseased state of the organ is indicated. I have, often observed, however, that when a small speck has formed in the pupil, it does not gradually increase, as by many it is supposed to do; on the contrary, I have, in many instances, known it remain in the same state for years without causing any material impediment to vision. I should not, therefore, reject a horse simply on account of this defect; that is, if the eyes appeared perfectly healthy in every other respect, and particularly if the speck was small,

nearer the edge than the centre of the pupil, and only in one eye: it would be advisable, however, to be certain that the pupils are alike in size; that they become small when the eyes are exposed to a strong light, and enlarge again when the horse is brought into a darker situation.

When an imperfection is observed in the eye, it is frequently said to arise from a bite, or blow, or from hay-seeds falling into it; but, though the seller should positively affirm this to be the cause of the imperfection, I should always be inclined to doubt it; because experience has taught me, that the diseases of the horse's eye almost always arise from internal causes; that, however trifling in appearance, they are really of a serious nature, and most commonly, even after they have been apparently cured, terminate, sooner or later, in blindness. Too much caution, therefore, cannot be observed in examining this important part.

When the eyes become inflamed from a blow, or bite, or from any dust getting into them, the disease, although apparently considerable, is seldom of long continuance; that is, when the injury is not severe, and proper means are employed for its removal. But when the inflammation has subsided, there often remains on the surface of the eye an opaque spot or *film*, as it is termed, which, in severe injuries, extends over

the whole of the cornea, or surface of the eye. After a little time, by applying the remedies directed in vol. i., this opacity gradually diminishes, and sometimes wholly disappears; more commonly, however, a small film remains, which does not, in any material degree, impede vision; this defect, therefore, is of no importance, and may safely be overlooked, provided the purchaser is certain that the opacity is really on the surface, and not in the pupil of the eye, and that the other parts appear bright, and free from every kind of imperfection. As a further security, a condition may be annexed to the warranty, by which the horse may be returned in three or four months, should the imperfection prove to be of a serious nature. When a complete cataract takes place,—which is known by the pupil being of a white or pearl colour, the strength of the other eye is generally restored, and it rarely becomes diseased afterwards, except from accidents: he may, therefore, be safely purchased as a one-eyed horse.

We have now to extend our investigation to another point, that is, the state of the wind, or rather of the lungs, and parts connected with them. When a horse is absolutely broken-winded, there is no difficulty in detecting the disease: the laborious breathing, or working of the flanks, particularly in going up a hill; and

the short asthmatic cough, are symptoms which cannot escape observation. Between this state of the lungs and perfect health there are many degrees; and it is the intermediate defects that we find most difficulty in discovering. The criterion, by which dealers judge of the state of the wind, is by no means a bad one: they make the horse cough by pinching or grasping the top of the windpipe: if the lungs are in that state which constitutes broken wind, or if they are approaching to that state, the sound of the cough is so peculiar that it cannot well be mistaken; it is short and husky, exactly like that of an asthmatic person. When this kind of cough is observed, the horse should be rejected, even if the motion of the flanks appear perfectly easy and regular. I have, in several instances, known broken wind apparently cured by keeping a horse at grass; that is, he seemed to breathe with ease, and did not cough when moderately exercised; but by pinching the throat, there was still that peculiar cough; and, by keeping him in the stable a few days, he became as bad as ever. It is advisable, however, for those, who have often occasion to purchase horses, to make themselves familiar with the sound of this asthmatic, or broken-winded cough: there will be no difficulty in this, as the complaint is very common. Horses are more liable to coughs than other domestic animals, probably from

loading their stomachs with hay, and from the sudden changes of temperature to which they are exposed. The complaint is sometimes of little importance, and, with care, easily removed: it often proves, however, extremely obstinate, and not unfrequently incurable. When a horse is observed to have a cough at the time of purchasing, it is necessary to inquire whether it be a recent complaint, or one of long standing; and this is a point that cannot be always easily determined. In the old, or chronic cough, as it is termed, the horse generally appears lively, feeds heartily, and appears in every other respect to be in perfect health: sometimes the sound of the cough is husky, or asthmatic, which indicates a tendency to broken wind; more commonly, it is loud and clear; the fit of coughing is generally violent, and the horse often appears as if some extraneous body had got into the windpipe, and he was endeavouring to cough it up.

The chronic cough is most considerable when the horse is first put in motion: by continuing the exercise, it gradually ceases; after which, the horse may be rode a long journey without coughing. I have often observed that horses with chronic cough are very shy of having their throats touched; often rearing and making considerable resistance, when any one attempts to make them cough by grasping the top of the

windpipe, and in many instances I have observed that they cannot be made to cough in this way, however strongly the windpipe be grasped; this, probably, as well as the shyness they manifest on the occasion, may arise from the trial having been made often upon them.

In the recent cough, the horse generally appears rather dull, and looks like a horse labouring under a catarrh, or cold: he readily coughs, when the windpipe is pinched; in doing which there is no difficulty, as the horse seldom makes any considerable resistance. In the recent cough, moderate trotting is sufficient to excite coughing, which is seldom diminished by continuing the exercise. In the chronic cough, the horse is sometimes relieved by throwing up mucus through the nostrils, and the cough is often so moderated, by strict attention to his diet and exercise, as to appear scarcely worth notice. I have also known it completely suppressed for the space of a day by means of opium. When a horse, therefore, is observed to have a cough, the purchaser may not always be able to determine whether the complaint be unimportant or of long standing, and incurable. In such doubtful cases, it would perhaps be the most prudent plan to secure himself by having a suitable condition added to the warranty.

There is another complaint of the lungs, or parts connected with them, and an incurable

one, which the purchaser should be guarded against. This disease is named *roaring*, from the wheezing noise a horse makes when rode fast, particularly when galloped up a hill; it is sometimes so considerable as to be heard at a distance of many yards; but in walking, or moderate exercise, it can seldom be perceived. The method which dealers usually employ to detect this complaint, at a repository, where no other trial is allowed, is to whip the horse under the belly and make him turn suddenly, or by making him leap over the bar; if he is a roarer this sudden exertion causes him to grunt. But this criterion should never be depended upon when an opportunity offers of galloping the horse.

The age of a horse is known by certain marks in the teeth (see vol. i.); when these are worn out, artificial marks are sometimes made, to make the horse appear younger than he really is. It often happens, also, that some of the sucking, or colt's teeth, are drawn out; in which case, they are soon replaced by horse's or permanent teeth; this is done with a view to make a horse of three or four years old appear to be five. As experience alone can enable the purchaser to detect these deceptions, it is advisable to have the age of the horse always expressed on the warranty; he can then avail himself of the first opportunity that offers of obtaining correct in-

formation on the subject; and, if he has been deceived, will, no doubt, have a right to return the animal.

I have known persons so cautious, when about to purchase a horse, as to examine the neck; and if they find marks of his having been bled often, they suspect, sometimes justly perhaps, that he has had some serious complaint. They have also thought it necessary to inspect the chest, belly, thighs, or the parts where rowels are usually placed; and, if they observe the marks which generally remain after rowelling, they suspect it was done for a complaint of the eyes, when the mark is under the throat, or between the branches of the under jawbone; and if in other parts, for what they term humours, that is, swelling of the legs, or grease.

Having finished our examination of the horse, as it relates to soundness, we have to inquire if he has any vicious habits, such as crib-biting, or if he is in any degree restive.

Crib-biting is a vicious habit, which often causes a horse to become lean and weak, and sometimes renders him very subject to flatulent colic. It is, therefore, a defect of importance, and a frequent cause of unsoundness. In crib-biting, the horse lays hold of the manger with his teeth, and appears to be sucking in air with an almost convulsive effort, and a slight, grunt-

ing noise. The manner in which this injures a horse has not been satisfactorily explained, but it is allowed by all to be an important defect. It may easily be detected by watching the horse for a short time in the stable.

Restiveness is sometimes discovered by separating a horse from his companion after riding together a few miles; or, after riding him, and bringing him back to his stable, by attempting to ride him off again: on these occasions, if a horse has any restiveness, he generally discovers it.

Before I finish this chapter, it may be proper to remind the reader, that we rarely meet with a horse that is in every respect perfect; and though, from the high price of the animal, it is necessary to be very cautious, yet it is possible, perhaps, to carry our caution too far; that is, there may be some trifling imperfection, such as a small splent, which is not worth noticing. One caution I always think necessary, however perfect the horse may appear; and this is, to have a receipt upon a stamp, in the hand-writing of the seller, in which the horse is described, and warranted sound, and free from vice.

This will be found very useful, should any defect afterwards appear which may render it necessary to return the horse. It is by many thought necessary, when a horse is returned, to

put him into the stable of the seller, or to get him to receive the horse; but it has been established in our courts of law that this is not necessary; and that it is sufficient to give notice, by a witness, that the horse is unsound, or vicious, or is not what he was warranted to be, and that he is ready to be delivered up when sent for.

It is advisable, after purchasing, neither to have him shoed nor to give him any medicine, until satisfied, by a sufficient trial, that he is in every respect sound.

Perhaps I have dwelt longer upon this subject than some of my readers may think necessary; but it should be recollected that it is intended only for those that are inexperienced in horses. It may be thought, also, that what I have written may tend to excite an unjust prejudice in the minds of those to whom it is addressed, or that it may make them over-cautious, and induce them to reject horses without sufficient reason: but, if we take into consideration the many defects or diseases to which horses are liable, the difficulty of detecting them, the numerous deceptions that are practised, and the shifts and evasions sometimes resorted to, I trust that in what I have written the candid reader will not accuse me of having gone too far, or that it will excite an undue prejudice against the horse-

dealer. I am aware that there are men in that *profession* who would descend to the deceptive practices I have occasionally hinted at; but have no doubt that there are also to be found among them men of integrity and honour.

I cannot conclude this subject without advising those who are satisfied with a moderate degree of goodness in a horse to put up with a few trifling faults, as it often happens that the rider is as much in fault as the horse; and after a little use these trivial faults often disappear.

CHAPTER XXXIV.

ON THROWING DOWN A HORSE IN ORDER TO SECURE OR HAMPER HIM FOR OPERATIONS.

HORSES are thrown down by means of hobbles, one of which is represented in Plate V, fig. 1 (where *a* is the buckle, *b* the ring); and all of them are represented fixed on a horse's legs in fig. 2. The hobble is about two feet in length, two inches and five-eighths in width, and about a quarter of an inch thick. It is formed by a strong piece of leather, about four feet in length, which, being doubled, has a strong iron buckle included at one end, and firmly sewed in. About four inches and a half further back, a large iron ring is to be sewed in, in the same manner, for the purpose of allowing a strong rope to pass through it easily. The ring, or rather the part so named, may be made straight where it is sewed into the leather, and the rest may be rounded. The remaining part of the leather is to be strongly sewed together, which will make the thickness of it what we have before described. Several holes are to be punched at this end of the hobble, to admit the tongue of

the buckle when it is put round the horse's leg. On the under side of the hobble, a piece of thinner and wider leather is to be fixed, extending from the part where the ring is attached to about half an inch beyond the extremity of the buckle; this is intended to prevent the latter from galling the horse's leg. The rope should be strong, not twisted tight, but made flexible, like a bell-rope, and about six yards in length. One end of the rope is to be firmly and permanently attached to the ring of one of the hobbles, and this hobble must be placed on the fore leg, opposite to the side on which the horse is to be thrown. If the hobble to which the rope is attached is placed on the left fore leg, the other end of the rope is to be passed first through the ring of that on the left hind leg, then through that on the right hind leg, next through that on the right fore leg, and lastly through the ring, where the rope is attached, that is, the left fore leg hobble.

By this contrivance it will be readily seen that the legs of the horse may be drawn together, so that if pushed or forced towards the right side, he must of necessity fall. Three men are generally required to pull the rope, in order to draw the leg stogether ; and, to render this more easy, the hind legs should be placed under him as much as possible before any attempt is made to pull the rope. The horse

should have blinds, or have his eyes covered with a piece of rug, before the hobbles are put on: it may be necessary, also, to twitch him, and hold up the fore leg while the hind leg hobble is putting on. But the twitch must be removed before he is thrown, and not used unless absolutely necessary. The men who are to pull the rope should stand within two yards of the horse, as they then pull with double the force they would at a distance of four yards, their power then having a tendency to draw the legs off the ground, and upwards, which causes him to fall more quickly. One man should stand at the rump, on the left side, to push him when the legs are drawn up together; and another should hold him steadily by the head, standing in front of him; and as soon as the horse is down, that man should throw himself on the neck, and incline the nose upward, by lifting the halter; thus he can keep the head and neck down without difficulty.

M. Girard, in his Traité du Pied, has proposed an improvement in throwing horses, which is very simple, and should always be employed; but it requires an additional assistant, or two would still be better. If the horse is to be thrown on the right side, a long piece of web, or a rope, is to be fastened round the right fore arm, close up to the elbow. The other end

is then to be passed over the withers, and held at a little distance by one or two men. The force which is applied in this way will cause the horse to fall more readily, and with more certainty, and exactly in the situation where he is required to be thrown. This contrivance, therefore, is extremely useful in confined places, where there is just room enough to throw a horse, and no more. The horse being thrown down, and his legs closely drawn together, the end of the hobble rope is to be passed under the hobble rings, between the fore and hind legs, and secured with a hitch, as it is termed, so that he cannot separate them again, until the hobbles are unbuckled, and then they all may be taken away at once, and the horse suffered to get up.

In letting the horse get up again, the hobbles must be unbuckled cautiously, beginning with the under fore and hind one. These should be unbuckled gently, and not jerked, as that would cause the horse to struggle, and render it difficult to take them off, or the leg might get loose, and he may thus hurt one of the assistants, who happens to be standing incautiously within the stroke of his fore or hind leg. I have seen hobbles in which the tongues were moveable, so that by drawing them out with a pair of pincers the hobbles were all taken off at once.

In performing operations upon the horse, it

is not only necessary to throw him down as I have described, but in firing the outside of the fore leg, for example, in the pastern, the hobble must be taken off, and the leg secured by means of a web passed round the leg above the knee, and secured to the upper hind leg, immediately above the hock, or it may be secured to the under fore leg; perhaps both these contrivances would be found useful in strong horses that struggle much. In firing the inside of the fore leg, that is, the under fore leg, nothing more is necessary than to take it out of the hobble, and draw it forwards by means of a web passed round the hoof, or the pastern.

Horses, however, have sufficient power to extend even the under fore leg considerably, unless a man lies on the shoulder, which should always be avoided. It is better to restrain the leg, by passing a web round it above the knee, and fastening the other end to the hind leg above the hock. If then the other three legs are drawn backward, by means of the hobble rope, the under fore leg will be sufficiently exposed for any operation that may be required. In firing the upper hind leg, in the pastern, it is necessary to take off the hobble; but the leg must first be secured by means of a web, fastened above the hock, and the other end brought forward, and, under a collar of web, passed round

the neck, close to the shoulder. The leg may thus be effectually restrained; but, as an additional restraint, it may be tied also to the under hind leg.

In securing a horse for castration, he should be placed on his left side; the right hind leg should then have one web placed above the hock, and another above the pastern; both of these webs should then be passed under the collar, and the leg drawn up as far as possible, or until the hind foot is brought considerably beyond the fore leg. Here it must be firmly secured, for unless this is done, the operator will be in great danger. When the upper hind leg is thus secured, the testicles will be completely exposed. I have found it useful also, in this operation, to make a man lie down on the horse's body, and grasp the hock and hind leg with his hands; this seems to confine the leg more completely.

Another method of hampering a horse is sometimes employed, but is far from being so safe or effectual as throwing him down. This is termed the side line. The rope hobble is buckled on one of the hind legs: the rope is then brought forward between the fore legs, and over the opposite shoulder; the end is then passed under the rope at the chest, and after drawing up the leg sufficiently, it is secured in

this situation with a hitch, which may be quickly loosened in case of the horse's struggling so as to be in danger of falling. This contrivance is rendered much more secure if the horse's head be firmly secured to a strong ring in the manger, and his hind parts supported by a breeching, while kicking and lying down may be prevented by a back and a belly strap.

There is a permanent contrivance for securing a horse in this way, named a break, or a trevis. I once knew a horse die by struggling in a break, therefore I consider them dangerous: they are chiefly used in nicking and docking horses, and in shoeing vicious animals. A plate, and description of a break, may be found in Bourgelat's 'Essai sur les Appareils et sur les Bandages propres aux Quadrupèdes.'

Another method is commonly employed in throwing down cattle. A long rope is doubled, and tied in a bow at the doubled end, of sufficient size to go over the animal's head, and rest at the bottom of his neck like a collar. The two ends, of equal length, are then to be brought down between the fore and hind legs, and one of the ends round each hind leg. The ends of the rope are now drawn forwards on both sides, by which the hind legs are so drawn up under the belly, that he is easily pushed down, and must then be secured.

Explanation of Plate V.

Letter A represents a curb, and the manner of firing for that disorder. B represents a small bone spavin, and the manner of firing for that disorder. C represents another manner of firing, more commonly employed; D another. E the straight line firing, sometimes carried all around the leg, and down over the pastern to the coronet. The pit of the heel must always be avoided both in firing and blistering, as it is apt to produce troublesome cracks or ulcers. F shows the seat of the disease named Mallenders. G the seat of the Speedy-Cut. H is the seat of the disorder named Thorough-Pin. I the seat of a bog spavin. K shows the hobble to which the rope is permanently attached. L the seat of the disease named Sallenders.

APPENDIX.

SETON THROUGH THE FROG.

A NEW operation has been practised at the Veterinary College for chronic lameness of the feet, which, it is said, has been so far successful as to have afforded considerable relief. It consists in passing a seton through the cleft of the frog, and bringing it out at the pit or hollow part of the heel.

In slight degrees of chronic lameness, we sometimes find that the horse goes much better upon a thrush taking place in the frog; and the lameness is sometimes completely removed by such a discharge. We also often find in thrushes, of some standing, or habitual thrushes, that, upon applying strong astringent or detergent preparations, and thereby stopping the thrush, that inflammation of the foot and lameness are the consequences.

In all cases of chronic lameness of the feet, attended with a morbid degree of heat, and a hard sound frog, it is advisable to keep the foot constantly soaked in a bran poultice: this will

always afford some relief; and I have thought that, by paring the frog in such cases, and keeping it in contact with fresh cow dung for some time, an artificial thrush may be established, and with considerable advantage. It is certainly worth a fair trial. Having thus established a thrush, a shoe should be applied with rather thick and wide heels. I have known chronic lameness much diminished, and even removed, by this treatment. A seton needle for this operation may be had at Mr. Long's, High Holborn, London; or at Mr. Clark's, York-buildings, Bath, veterinary instrument makers and cutlers.

Since this volume first went to press, the Nerve Operation appears to have fallen considerably in the opinion of the public, from many cases having occurred of loss of the hoofs, and mortification of the feet, at different periods after the operation. There are cases, however, in which it is decidedly useful, and sufficiently durable in its effect, to render its adoption advisable.

Much has been said of the cruelty of the operation, but always by persons who know but little about it, and who have no practical knowledge of its immediate or remote effects. The pain of dividing the nerve is but momentary; the relief it affords is considerable and imme-

diate, and sometimes, especially when the horse is a proper subject for the operation, it lasts for many years.

It has been ascertained that the substance which supplies the place of the portion of nerve which has been removed is not capable of conducting sensation, though it has somewhat the appearance of nerve.

Mr. Leigh, veterinary surgeon, of Bristol, had a horse under his care affected with canker. This horse became so violent while dressing, from the pain he suffered, that it was found at last impossible to do any thing with him. The Nerve Operation was therefore performed, in order to render the foot insensible. After this the horse was dressed without difficulty, and the canker was completely cured. This happened about four years ago, and the horse is at this time quite sound, and very useful as a carriage horse.

The same person informs me that he has met with several cases of chronic lameness lately, which appear to confirm what I have before observed, when speaking of the Nerve Operation and Founder, that is, that in a large proportion of such cases there is a disease of the coffin-joint, especially at the articulation of the navicula with the coffin-bone, and sometimes with the pastern. See the Chapter on Thrush, and the Sections on Nerve Operation, and Founder.

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C. Baldwin, Printer,
New Bridge-street, London.